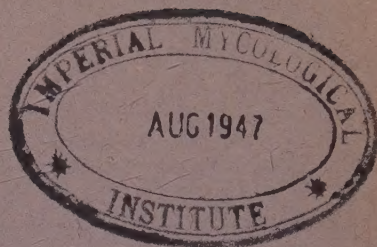


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Errata

V.B. 14. 163, abst. 1046. For "MONNIG, H. O." read "MÖNNIG, H. O."

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[No. 7.

DISEASES CAUSED BY BACTERIA AND FUNGI

COTONI, L., FORGEOT, P., & THIEULIN, G. (1946.)
Sur les streptocoques des mammites bovines.
[*Streptococcal mastitis in cattle.*—*Ann. Inst.*
Pasteur. 72. 184-202. 1273

For culture work serum agar was the medium of choice. In instances where cultures were unobtainable from milk in which streptococci were visible in films, a search was made for bacteriophage, to ascertain if its presence would explain the phenomenon, but none was demonstrated.

Of 58 strains examined, 38 were identified as typical *Str. agalactiae*, ten as only slightly atypical and two as enterococci: eight were difficult to classify. Because of the marked variation of *Str. agalactiae* both in culture and in films, biochemical reactions were used for more exact identification.

These reactions are listed in tables and the comparative importance of each is discussed. For identification of *Str. agalactiae* as distinct from the other pyogenic streptococci most reliance is placed on the hydrolysis of sodium hippurate, although this reaction occurs with other organisms such as *Str. uberis* or enterococci. Next in order of importance come the failure to split aesculin and ferment mannitol. Other tests included growth at 37°C. on Sherman's methylene-blue, in 6.5% NaCl at 45°C., and resistance to a temperature of 60°C. for 30 min. The conclusion was reached that, when mastitis organisms other than typical *Str. agalactiae* are examined, characteristics are extremely variable depending on the medium used for culture.

Serological tests were carried out on some of the strains isolated and the importance of these methods of identification is emphasized, but the authors have nothing new to say on this subject.

—C. D. WILSON.

WATTS, P. S. (1945.) The effect of humidity on the survival of dried cultures of *Streptococcus agalactiae*.—*J. Path. Bact.* 57. 191-197. 1274

Because of the absence of any facilities for freeze-drying cultures of *Str. agalactiae*, quantitative tests were made on the viability of this species

when one drop of a young litmus milk culture was preliminarily treated by incubation at 37°C. for 24 hours, followed by prolonged storage in desiccators containing pure sulphuric acid. Under such conditions the cultures remained fully viable up to three years and retained their original serological and biochemical characters. An investigation was then made of the effect of varying degrees of humidity during storage. The addition of water to the sulphuric acid in certain of the desiccators enabled differing degrees of relative humidity in the range 0-75% to be tested. The cultures were stored at room temperature in the dark and frequent viable counts were made. A relative humidity greater than 60% caused the early death of the three different strains tested (11 weeks). As the degree of humidity decreased from that level, the longevity of the cultures rapidly increased. After about three years the gradually diminishing number of viable organisms in the cultures kept in a dry atmosphere fell sharply to zero, whereas the samples in conditions of 10-25% relative humidity still gave positive subcultures.—J. KEPPIE.

GREISEN, E. C. (1942.) The oxidation of alcohol by *Streptococcus mastitidis*.—*Thesis, Cornell.* pp. 69. 1275

These studies were carried on in an attempt to ascertain if the Group B streptococci possess a complete mechanism for the transformation of alcohol to acetic acid. The organism used in the work was *Str. mastitidis*, Lancefield Group B, originally isolated from milk. The resting cell technique was used throughout the experiments, most of which were carried out in a Warburg respirometer.

The studies do not lend themselves well to abstracting. However, it was found that a reaction occurred in which ethyl alcohol was oxidized to acetic acid with the intermediate formation of acetaldehyde. Under anaerobic conditions the formation of acid from acetaldehyde took place by dismutation.

It was found that for each mol. [= gramme-

molecule] of ethyl alcohol used as a substrate, one mol. of oxygen was taken up. The reaction occurred in two stages in which $\frac{1}{2}$ mol. of oxygen was used in transforming alcohol to aldehyde and $\frac{1}{2}$ mol. in transforming aldehyde to acid. The second reaction, the formation of acid, took place both aerobically and anaerobically. Aerobically 1 mol. of acid was formed for each mol. of acetaldehyde used as a substrate and anaerobically $\frac{1}{2}$ mol. of acid was formed. This indicated the presence of an aldehyde mutase. An aldehyde oxidase may also occur.—H. L. GILMAN.

HENRY, J. E., & HENRY, R. J. (1946.) **Studies on the relationship between bacteriophage and bacterial host cell. I. Adsorption of phage by variants of staphylococcus.**—*J. Bact.* 52. 481–486. 1276

From a strain of *Staph. aureus* a phage-resistant variant was obtained. This variant adsorbed the phage active against the parent strain specifically and to the same degree as the parent strain. The adsorption of the phage on to the resistant variant was not followed by any detectable lytic activity.—A. MAYR-HARTING.

HAMBURGER, M., Jr. (1946.) **The detection of dangerous carriers of hemolytic streptococci by the measurement of their "streptococcal output".**—*J. Lab. clin. Med.* 31. 460–462. 1277

The number of β -haemolytic streptococci expelled into the environment by patients with streptococcal tonsillitis, pharyngitis and scarlet fever was measured. As a test object a patch sown on to the bed clothing was employed. It was shown that patients with strongly positive "nose cultures" spread many more organisms than those with positive "throat cultures" only. Therefore it is concluded that the former represent a more dangerous group of carriers than the latter.

—E. KLIENEGER-NOBEL.

KUEHNER, R. L. (1946.) **Taxonomic studies on the enterococci.**—*Yale J. Biol. Med.* 18. 185–216. 1278

A review of the literature dealing with the characters of the enterococci reveals much contradictory evidence. In the present study, 64 strains, isolated mainly from human and animal faeces but also from dairy products and vegetables, were examined in detail. The evidence obtained supports the view that the enterococci form a group of organisms within the genus *Streptococcus* which has sufficient clearly defined characters to merit the rank of species. Enterococci survive a temperature of 60°C. for 30 min., and they can also grow in a medium containing 10–15% sodium chloride, both of which treatments can be used in the primary isolation stage. In morphology they are predominantly lanceolate diplococci.

When originally isolated they grow on MacConkey's medium and withstand up to 40% bile-salt, but on subculture their resistance declines to a maximum of about 5%. The following carbohydrates are fermented with the production of acid:—glucose, lactose, maltose, fructose and galactose. No change occurs in raffinose, arabinose or dulcitol. Enterococci from all sources belong to Group D of Lancefield. In agglutination tests each strain shows strain-specificity. All strains grow within a wide range of temperature (4–48°C.) and of pH (3–10). Pathogenicity tests by means of parenteral injection and feeding were largely negative and it was concluded that enterococci are not usually pathogenic except occasionally in mice. Individual strains have a characteristic size, colony-appearance, and activity in gelatin and litmus-milk, etc., but K. disapproves of attempts to create types within the proposed species on the ground that such differences between strains are only minor ones and relatively unimportant.

—J. KEPPIE.

BLAKEMORE, F., & GLEDHILL, A. W. (1946.) **Studies on vibronic infection of sheep. I. The agglutination test as a means of diagnosis.**

II. **The antigenic relationship between strains of *V. foetus*.**—*J. comp. Path.* 56. 69–77. 1279

I. Four strains of *V. foetus* were recovered from aborted lambs during the course of outbreaks in widely-separated parts of East Anglia; two of these (VS and VT) remained motile, while the other two (VB and VC) became non-motile after a few subcultures. Antigens for agglutination tests were prepared by growing the organisms aerobically for three days at 37°C. in 5% horse serum broth and re-suspending the centrifuged deposit in merthiolated saline to an opacity equal to Brown's tube no. 3. Tests were made with two-fold serial dilutions of sera, starting at 1:20, final readings being made after 18 hours' incubation at 37°C.

Serum samples were obtained from ten shearlings and ten ewes in a flock in which the abortion rate had been insignificant for a number of years. Tested against strain VS, one ewe and one shearling gave almost complete agglutination at 1:20, the remainder giving a trace or no agglutination only. In a flock in which an outbreak of abortion had occurred two months previously, serum was taken from ewes which had aborted, from in-contact ewes (normal and barren) and from normal lambs. If a titre of 1:40 was regarded as significant, five of the ten ewes which aborted and two of the ten barren ewes gave a positive result against the infecting strain VB.

From ten ewes which had aborted in another flock, blood samples were taken 14, 60, 120, and

210 days after abortion and titres determined against the infecting strain VS. Titres of 1:40 were given at the four tests by seven, three, three and three ewes respectively. Some sera had a higher titre at a later test than at the preceding one, suggesting that infection or re-infection may occur between gestation.

The agglutination titres of seven ewes were determined 1-5 days after abortion, against the strain VT isolated from the flock and against strain VS from another outbreak: all seven gave positive titres (1:40) with VT and three with VS. A similar test with ten sera, 14 days after abortion, from the outbreak yielding strain VS, gave seven positive with VS, and three with the now non-motile strain VB.

Of three sera from ewes which aborted in the flock from which strain VC was isolated, two only produced a trace of agglutination against VC at 1:20 and none agglutinated VS significantly.

The agglutination test cannot therefore be recommended for the routine diagnosis of vibronic abortion, although there may be occasions in which it is of some ancillary value.

II. While it was not possible to form an adequate picture of the antigenic structure from an examination of only four strains, it could be concluded that not all strains were homogeneous, and that there were type-specific antigens. While there was evidence of antigenic relationship between the flagellar antigens of the two motile strains examined, the O-antigens of two of the four strains, as judged by tests on alcohol-treated suspensions, were completely heterologous. Routine diagnostic tests against a single laboratory strain were thus of very little value.—E. COTCHIN.

I. OVERBEEK, A. A. (1940.) Rundertuberculosebestrijding in Nederland. [**Control of bovine TB. in the Netherlands.**—*Tijdschr. Diergeneesk.* 67. 754-759. 1280

II. TER BORG, H. (1940.) Enkele opmerkingen over georganiseerde tuberculose-bestrijding, naar aanleiding van het rapport, uitgebracht door de commissie in 1939 ingesteld door het hoofdbestuur, in het bijzonder wat betreft de vraag of de dierenarts al dan niet van een hulpmacht gebruik moet maken. [**Observations on organized TB. control, in connexion with the report issued by the commission set up in 1939**—see *V. B.* 11. 424.]—*Ibid.* 87. 760-773. 1281

III. AUKEMA, C. (1940.) Naar aanleiding van het rapport tuberculosecommissie. [**The report of the TB. commission.**—*Ibid.* 67. 774-777. 1282

IV. TERVOERT, G. H. J. (1942.) Tuberculosebestrijding. [**TB. control.**—*Ibid.* 69. 122-123. 1283

V. OVERBEEK, A. A. (1942.) Algemeene bestrijding der rundertuberculose. [**General control of bovine TB.**—*Ibid.* 69. 267-271. 1284

I. The author comments on the slow progress in eradication of bovine TB. in Holland and attacks the attitude that reactors to the tuberculin test which are clinically healthy need not be isolated. He emphasizes that reactors should be kept only in segregation. This can be done through properly organized voluntary effort of a co-operative nature.

II. The author discusses the principles of TB. eradication, with special reference to the problem of compensation for slaughter of open cases, the cost of this system, the manner in which it should be provided and its relation to the veterinary surgeon. It is emphasized that adequate veterinary service is essential for successful control work. The use of unqualified assistants in some of the work is advocated.

The usefulness and ease of interpretation of the ophthalmic and single intradermal tuberculin tests are described, the author advocating freedom of choice as to test for the veterinarian.

III. Certain difficulties in voluntary control schemes are considered. Unless there is a sound system for dealing with reactors, a farmer can sell off tuberculous cattle and secure a TB.-free herd, but the animals so disposed of may spread infection. There should be not one but a range of control schemes for application to the various provinces, depending on the initial incidence of TB., on the type, size, etc., of herds and on other relevant factors. Elasticity is necessary, but the system must be progressive.

[The report referred to in the title of II recommended a voluntary effort, but these three commentaries, especially the last, point out that such effort must at least be thoroughly organized if it is to achieve results.]

IV. T. suggests a special nation-wide bovine TB. control organization and universal tuberculin testing, with slaughter of open cases and segregation of reactors, under control of special personnel, for fattening and slaughter. Cattle should be valued before being tuberculin-tested and should be ear-marked after such tests. The cost of the work should be divided between the farmers and the state and compensation should be paid for animals removed for immediate or delayed slaughter.

V. In a second communication, O. ranges over many aspects of TB. control and says that the measure most likely to overcome the inertia of existing difficulties, especially in the segregation problem, is an adequate premium price for milk produced by TB.-free herds.—J. E.

OTTOSEN, H. E. (1941.) Nogle differential-diagnostiske Problemer vedrørende den patologisk-anatomiske Konstatering af Tuberkulose. [Differential diagnosis in the P.M. examination of tuberculous carcasses.]—*Maanedsskr. Dyrslaeger.* 53. 97-122. 1285

Cases sent to the State Serum Laboratory, Copenhagen, for diagnosis in the course of the TB. control work are described. In nine cases extended tumour formations found P.M. at abattoirs were thought to be related to TB. In four cases (cattle) adenocarcinoma, and in one, plane-cell carcinomatosis were diagnosed. The tumours were widely extended on the peritoneum and other organs, especially in the abdomen. Two cases of haemangio-endothelioma (one in a horse) and two cases of sarcomatosis (cattle) are described. Subcutaneous processes which develop in cattle on the sites of foot and mouth disease vaccination are occasionally found. In some cases they are old abscesses with thick pus: in others they are chronic granulomata resembling lymphoid tissue and are possibly caused by the irritant effect of aluminium hydroxide in the vaccine. In a number of other cases various tumorous processes, abscesses and actinomycosis of peculiar appearance were found.—H. C. BENDIXEN.

MOLTZEN-NIELSEN, H., & PLUM, N. (1949.) Tuberkulose hos Hunden. [TB. in dogs.]—*Maanedsskr. Dyrslaeger.* 54. 201-213. 1286

Reports have been collected from the literature on 179 tuberculous dogs, in which determinations were made of the type of bacilli involved. 27% were found to be of bovine, 70% of human and 0.5% of avian type; 2% were atypical. During 1935, TB. was found in eight of 1,879 dogs (0.42%) examined P.M. at the Veterinary College of Copenhagen. In 11 of 14 other cases, tubercle bacilli were of the human type; three were of the bovine type. The authors state that tuberculous dogs are generally active spreaders of infection through expectorate, faeces, urine, chronic wounds and fistulae. Thirteen clinical cases are described: in five cases infection was localized to the lymph nodes (submandibular and mesenteric) and in five to the thorax; in two cases there was tuberculous polyarthritis and in one case generalized TB.—H. C. BENDIXEN.

ANDERSON, R. J. (1943.) The chemistry of the lipids of the tubercle bacillus.—*Yale J. Biol. Med.* 15. 311-345. 1287

This review summarizes the work of A. and his colleagues over a period of 15 years. The lipid fractions of the tubercle bacillus are unique in structure and composition and many of their compounds have not previously been described.

The fats are not glycerides, but fatty acid esters of the disaccharide trehalose. The phosphatides are combined with a carbohydrate which contains phosphorus and which yields mannose and inositol on hydrolysis. The waxes are mixtures containing mostly fatty acid esters of carbohydrates, but some true waxes and small amounts of glycerides are present in some of the wax fractions. The waxes contain some characteristic higher alcohols. The alcohol phthiocerol occurs only in the wax of the human and bovine types of tubercle bacilli. The secondary alcohols *d*-eicosanol-2 and *d*-octadecanol-2 are found in the wax fractions of the Timothy-grass bacillus, the avian type tubercle bacillus and the leprosy bacillus. All the wax fractions contain optically active hydroxy-acids of high molecular weight which have been given the collective name of mycolic acid. All strains examined contain one or more mycolic acids which differed in their properties. The mycolic acids are acid-fast. The firmly bound lipoids of avian type tubercle bacilli contain a specific polysaccharide which, like that of human bacilli, contains mannose, *d*-arabinose, and galactose, but in different proportions. A comprehensive list of references is given.—ALEX. B. PATERSON.

HEILMAN, D. H., FELDMAN, W. H., & MANN, F. C. (1945.) The specific cytotoxic action of tuberculin. The reaction of tissues from animals sensitized with heat-killed tubercle bacilli.—*Amer. Rev. Tuberc.* 52. 65-72. [Spanish summary.] 1288

Intratesticular injection into rabbits of 5 mg. killed human tubercle bacilli ground with paraffin led to tuberculin-sensitivity of the large wandering splenic cells. The motilities of the latter were studied by quantitative tissue culture methods in splenic explants, the extent of cellular migration being determined by an ocular micrometer. The average radius of the migration zone in test cultures was compared with that in the control cultures in the presence and absence of tuberculin.

A large variation in cellular sensitivity occurred in rabbits, the response being more uniform in tuberculous animals. All rabbits injected with killed tubercle bacilli developed precipitating antibodies and skin sensitivity to Old Tuberculin, but the antibodies did not diminish the cytotoxic effect when added to cultures of sensitive cells.—ALEX. B. PATERSON.

CAMERON, C., & PURDIE, I. A. (1946.) The intracutaneous injection of vole tubercle bacilli in tuberculous persons.—*Tubercle, Lond.* 27. 195-201. 1289

A number of Mantoux-positive human patients with tuberculous infections of varying

intensity were injected intradermally with varying doses of living or dead vole bacilli. In every case there was a papulo-pustular reaction resembling a modified Koch's phenomenon. The vole bacilli remained in the local lesions for a short time but did not appear to infect the adjacent lymph nodes. None of the patients was affected adversely by the injection, which did not, however, appear to modify the course of the disease.—R. E. GLOVER.

KELLER, H. (1948.) Miliare und submiliare Nierenflecken als Artefakte. [*Miliary and submiliary kidney lesions as artefacts simulating tuberculosis.*]—*Z. Fleisch- u. Milchhyg.* 53. 107–108. 1290

In the examination of the bovine kidney for the presence of very small tubercles, the edge of a knife is sometimes drawn firmly over the surface to free it from confusing particles of fat. The pressure of the knife may cause small yellow spots to appear, extending a little way below the surface of the cortex into the substance of the kidney and these may be confused with tubercles, unless closely examined. Similar artefacts are not produced in the kidney of the horse or pig.—E. COTCHIN.

BROOKS, R. F. (1942.) A study of certain members of the genus *Corynebacterium* from animal sources.—*Thesis, Cornell*. pp. 85. 1291

A study was made of the serological, cultural, and biochemical characteristics of 79 strains of organisms belonging to the genus *Corynebacterium* isolated from normal and pathologic animal sources, in an attempt to find improved methods of differentiating between such organisms and to clarify their relationships to each other.

The wide range of variability in members of this group preclude the establishment of a dichotomous key system for differentiating these organisms and necessitates their separation into more general groups based on their relative activity, such as pellicle formation in nutrient broth, reaction in litmus milk, pigment production on blood serum slant, reduction of nitrates to nitrites, hydrogen sulphide production, and reaction in glucose broth. Many of these characteristics have been found typical of certain species.

B. divides the organisms into three groups. Group I, with a high degree of activity, is called the *Corynebact. equi* group. Pellicle is formed in nutrient broth, the final reaction in litmus milk is alkaline, yellow pigment is produced on blood serum slant, nitrates are reduced to nitrites, hydrogen sulphide is produced, and the final reaction in glucose broth is alkaline. Group II is called the intermediate group, with a medium degree of activity. Pellicle formation is usually present in nutrient broth, the final reaction in

litmus milk is usually alkaline, yellow pigment may or may not be produced on blood serum slants, nitrates may or may not be reduced to nitrites, hydrogen sulphide is not produced by a majority of the strains, and final reaction in glucose broth is usually weakly acid. Group III is the *Corynebact. pyogenes* group, with a low degree of activity. Pellicle is rarely formed in nutrient broth, the final reaction in litmus milk is acid, no yellow pigment is formed on blood slants, nitrates are not reduced to nitrites, hydrogen sulphide is not formed (most strains failed to grow on the medium), and the final reaction in glucose broth is weakly acid.—H. L. GILMAN.

KING, P. F. (1946.) Erysipeloid. Survey of 115 cases.—*Lancet*. 251. 196–198. 1292

Of 2,300 cases treated at a septic hand clinic in London from May, 1941, to the end of December, 1945, 115, or 5%, were due to infection with *E. rhusiopathiae*. 95% of the cases occurred in people connected with the handling of food such as cooks, housewives, butchers, poulterers and fishmongers. Second attacks occurred in two of the cases.

The results of various treatments are discussed. There was little variation in the duration of the infection treated in various ways except that untreated cases healed most quickly, while sulphathiazole definitely retarded healing. Penicillin was not used in this series of cases. Results obtained by BARBER *et al.* (1946) with intramuscular penicillin are quoted for comparison. Penicillin given intramuscularly is the only treatment known which markedly reduces the duration of treatment (two days in the cases described by BARBER, as against 14–33 days with other treatments). There was a definite seasonal incidence, with a marked rise in summer and autumn. This coincided with the season of highest incidence of swine erysipelas in Great Britain and it is suggested that flies may act as vectors of infection from pigs to human foodstuffs.—M. C.

BYTHELL, D. W. P. (1945.) Bovine pasteurellosis. The occurrence of haemorrhagic septicaemia and broncho-pneumonia simultaneously in one outbreak among young calves.—*Vet. Rec.* 57. 289–290. 1293

Serious losses occurred during the winter in young calves kept intensively. In two calves which died after three days, cultural examination revealed generalized *P. bovisseptica* infection. Two forms of the infection were distinguishable. The peracute form caused the rapid death of very young calves. The chronic form was a persistent broncho-pneumonia marked by respiratory embarrassment, soft cough and nasal discharge, which affected some animals for several weeks. The

affected calves continued to thrive and increase in weight. A culture of the causative organism was pathogenic for calves and mice, but another factor in the outbreak was thought to be the overcrowding of the calves in unhygienic conditions. Attempts to control the disease by means of antiserum and vaccine were inconclusive and eventually the outbreak abated.—J. KEPPIE.

WHEELER, C. M., & DOUGLAS, J. R. (1945.) **Sylvatic plague studies. V. The determination of vector efficiency.**—*J. infect. Dis.* 77. 1-12. [For parts I-III, see *V. B.* 14. 4. Part IV not traced.] 1294

Several species of flea, including the classical rat flea, squirrel fleas and the cat flea, were tested under controlled experimental conditions for their comparative efficiency in transmitting *P. pestis*. A standardized experimental method using the white mouse as infected donor and also as susceptible host enabled the vector efficiency of each flea species to be quantitatively assessed. The results revealed considerable variation among the species of fleas as regards their relative ability to transmit infection, remain alive while infected and transmit infection during defaecation. Such information is of value in the investigation of flea-borne epidemics.—J. KEPPIE.

SHAFFER, J. H. (1943.) **Tularemia: report of four cases with unusual contacts.**—*Ann. intern. Med.* 18. 72-80. 1295

Attention is again drawn to the fact that the cat is naturally and experimentally susceptible to tularemia and that cases of human infection have been recorded as following cat bites or scratches. It is pointed out that in America, where several forms of wild-life are infected, domestic cats in rural communities may become contaminated or infected while out hunting in the fields.

Three of the four human patients whose cases are described here were infected by domestic cats (the fourth by the bite of a wood tick). In the first case, the patient had an itching pustular lesion on the dorsum of the left hand and enlarged and tender epitrochlear and axillary lymph nodes; there was general malaise, with chills and night sweats. Both the serum of the patient and his cat agglutinated *Past. tularensis*. Examination of the cat, which the patient habitually fondled and which had been limping for several weeks, showed a healed skin ulcer on the left hind leg. In the second case, a boy was infected by being bitten in the cheek by a farm cat, which had no gross or microscopic lesions of tularemia at autopsy. The third patient developed a tularemia lesion of the axillary lymph node some weeks after being bitten on the finger by her cat: this finger wound had healed uneventfully.—E. COTCHIN.

CHERRY, W. B., LENTZ, P. L., & BARNES, L. A. (1946.) **Implication of *Proteus mirabilis* in an outbreak of gastroenteritis.**—*Amer. J. publ. Hlth.* 36. 484-488. 1296

The demonstration of apparently identical strains of *P. mirabilis* in faeces, vomit and suspected ham from nine out of 29 patients involved in an outbreak of gastro-enteritis, together with low counts of staphylococci and streptococci, led the authors to incriminate *P. mirabilis* as the causal organism.—R. SCARISBRICK.

CHRISTENSEN, W. B. (1946.) **Urea decomposition as a means of differentiating *Proteus* and paracolon cultures from each other and from *Salmonella* and *Shigella* types.**—*J. Bact.* 52. 461-466. 1297

A urea medium for the detection of *Proteus vulgaris* in faeces is described. It differs from other media used for the same purpose by the addition of 0.1% peptone and 0.1% glucose to the synthetic base with phenol-red as indicator; this allows growth of organisms unable to utilize urea as the sole source of nitrogen. The quantities of glucose and peptone are too small to cause false reactions, the acid products of glucose fermentation counteract the alkalinity produced by peptone decomposition and the glucose serves as a source of energy and so protects the peptone from being broken down appreciably. Tested with a large number of intestinal organisms the medium gave a very marked red-violet colour reaction after a few hours' incubation with all species of *Proteus*, and a reaction developing after a few days only with "Paracolon aerobacter" and "Paracolon intermediate"; with other intestinal organisms of the *Bact. coli-Salmonella* dysentery group the reaction was negative or the colour change was slight and could not be mistaken for the clear-cut reaction which indicates urease activity.

—A. MAYR-HARTING.

HANSEN, A. C. (1941.) **Om Serodiagnostik ved Paratyfus hos Duer. [Serodiagnosis of paratyphoid in pigeons.]**—*Maanedsskr. Dyrlaeger.* 53. 129-135. 1298

The aetiology, symptomatology and morbid anatomy of paratyphoid in pigeons are described. Spread of infection is due to excretion of the *S. typhi-murium* strain responsible, or to infection from eggs. Clinically healthy birds are frequently carriers. Test tube serum agglutination tests were carried out on 30 pigeons from different lofts using separated O and H antigens. Bacteriological examinations were also performed. Pigeons with H agglutinin of titre 1:10 were considered infected. The organism was rarely isolated from birds with O-agglutinin, but the presence of O-agglutinin in the absence of H-agglutinin was

regarded with suspicion. A negative serological reaction did not exclude infection. Further investigation on O-agglutination and serologically negative carriers is necessary.—E. F. MCCARTHY.

JENKINS, C. E. (1946.) **The preparation of pure flagellar antigens from salmonella.**—*Brit. J. exp. Path.* 27. 121-127. 1299

J. discusses methods which have been used in the preparation of H-antigens for the investigation of flagellar agglutination. Two methods are described in some detail for the preparation of purified [*i.e.*, containing no somatic antigen] flagellar antigens, (1) by the use of dioxan (diethylene dioxide) and (2) by the use of pyridine. From titration experiments it was concluded that the specificity of the purified flagellar antigen was not inferior to that of the corresponding H-antigen.

The nature and properties of the antigen are discussed and J. concludes that it is probably a suspension in a fine state of division. It does not contain any somatic antigen and it appears to be a protein which can be concentrated by methods described. Heat destroys its zymophore group but leaves its haptophore group unchanged.

—D. LUKE.

EDWARDS, P. R., & BRUNER, D. W. (1946.) **Notes on monophasic salmonella cultures and their use in the production of diagnostic serums.**—*J. Bact.* 52. 493-498. [Authors' summary copied *verbatim*.] 1300

Monophasic variants of a number of *Salmonella* types were described. These furnished excellent antigens for the production of phase-specific serums. When it was possible to isolate the second phase of these variants by the Gard technique, the phases thus obtained also were useful in the production of specific serums.

CARSON, J. R. (1942.) **Breed differences in bactericidal power of the blood plasma in chickens over *Salmonella pullorum*.**—*Thesis, Cornell.* pp. 20. 1301

Other investigators have demonstrated that White Leghorns are significantly more resistant to pullorum disease than the heavier breeds and that the period of greatest susceptibility to *S. pullorum* is from hatching to five days of age. C. conducted *in vitro* experiments to determine the presence of bactericidins against *S. pullorum* in day-old chicks of the White Leghorn and New Hampshire breeds. No significant difference in the two breeds was noted. Further experiments with the blood of 30 pullets, each of the same two breeds, failed to show more than slight differences in the bactericidal potency of their blood. C. concludes that the difference in resistance to pullorum infection between White Leghorns and

New Hampshire is not accompanied by a similar difference in the bactericidal activity of their blood plasma.—H. L. GILMAN.

EDWARDS, S. J., McDIARMID, A., DE ROPP, R. S., & McLEOD, D. H. (1946.) **Immunity in cattle vaccinated with *Brucella abortus* strain 19 and a note comparing this strain with 45/20.**—*Vet. Rec.* 58. 141-146. 1302

In these experiments 50 heifers were divided into five groups of ten. Two groups were vaccinated with 5 ml. of strain 19 having a viable count of 12,000 million organisms per ml. In about the fifth month of pregnancy cattle in one group were infected in the eye with approximately 15 million organisms each and in the other group with approximately 150 million organisms each of a virulent CO₂-sensitive strain (544). Two groups were used as controls, being left unvaccinated, but receiving the infective dose. The remaining group of ten animals, which were neither vaccinated nor infected, were used as a check on the isolation methods. These all remained negative to agglutination tests and cultural examinations, although one aborted from a non-specific cause.

The results of the experiments, including agglutination tests, cultural examinations of membranes, etc., are shown in a series of tables. The results of ten milk examinations subsequent to parturition are also tabulated. Of nine remaining vaccinated animals which received the smaller infective dose, all calved normally but one was infected, whereas of nine controls eight calved prematurely, there being a total of three living and six dead calves. In the vaccinated group the mean duration of pregnancy was 280 days and in the controls 246 days. In the group of ten vaccinated heifers which received the larger infective dose, one aborted from a non-specific cause and two others proved to be infected, one of these producing a premature dead calf. The remaining seven calved normally and were not infected. In the controls, all ten heifers proved infected and calved prematurely, nine of the calves being dead. The mean duration of pregnancy was 275 days in the vaccinated heifers and 224 days in the controls. Of ten milk examinations made after parturition in the smaller infective dose groups, none were found positive in the vaccinated animals and 70 out of 90 examinations proved positive in the controls. In the larger infective dose groups, nine out of 100 examinations of the vaccinated animals proved positive and in the controls 55 out of 100 examinations.

The authors compare these results by means of diagrams with those of a previous experiment in which strain 45/20 was used for vaccination and conclude that strain 19 gives the greater immunity.

—S. J. GILBERT.

STAUB, R. R. (1944.) **Brucellosis an unrecognized menace.**—*Northw. Med.* 43. 274-279. 1303

It has been estimated that the prevalence of brucellosis in the American population is 10-15%, chiefly affecting personnel of dairy and livestock communities, slaughter and packing house employees, etc.

S. discusses the frequently insidious nature of the disease in human beings and the difficulties of diagnosis and describes the symptoms, methods of diagnosis and treatment. In the chronic form, fever may be absent and many cases remain undiagnosed.—S. J. GILBERT.

WINTERS, A. (1946.) **Control of brucellosis in New York State dairy herds and its relation to the milk supply.**—*Rep. N.Y. St. Ass. Milk Sanit.*, 1945. pp. 79-88. Discussion pp. 89-90. 1304

W. gives an account of control measures applied in New York State and the application of calfhood vaccination with strain 19. Two plans are provided, *viz.*, one in which herds are blood-tested and calves vaccinated, and another in which the calves are vaccinated and there are also other control measures such as adult vaccination. In both cases the object is the elimination of the reactors. 2,500 herds have transferred to the calf vaccination plan whilst some 300 herds still remain under the test and slaughter plan.—S. J. G.

BALLENTINE, R., TUCK, G. M., SCHNEIDER, L. K., & RYAN, F. J. (1944.) **An unidentified growth factor for a gas gangrene clostridium.**—*J. Amer. chem. Soc.* 66. 1990-1991. 1305

A synthetic culture medium capable of supporting the growth of *Cl. tetani* was found to be inadequate for *Cl. welchii* in the absence of yeast extract or peptone. Attempts to replace the yeast extract with the more common essential metabolites failed. The specific growth factor has not yet been obtained in pure form, but the physical and chemical properties of its impure form are described and these serve to show that it is distinct from the *Cl. sporogenes* vitamin and streptogenin.—J. KEEPIE.

PIRATININGA, S. N. (1943.) **Esporotricose em mular. [Sporotrichosis in a mule.]**—*Rev. Fac. Med. vet. S. Paulo.* 2. 219-222. 1306

Sp. beurmanni infection is recorded in a mule in Brazil. The lesions, which occurred on the breast, left fore-leg, belly, prepuce and inside the thighs, consisted of ulcers, nodules and abscesses dotted along the courses of lymphatic vessels. The left prescapular and the popliteal lymph nodes were suppurated and the other nodes were enlarged and indurated.—U. F. RICHARDSON.

KOVALENKO, Y. R. 1943. Sokhranyaemost'

palochki nekroza vo vneshnei srede. [Viability of *Fusiformis necrophorus* outside the body.]—*Veterinariya, Moscow.* No. 5-6. pp. 34-36. 1307

K. investigated the faeces of cattle with *F. necrophorus* infection and found that, on an average, 52.8% of specimens were positive. In a parallel investigation dealing with the faeces of healthy animals (cattle and sheep) from farms where no cases of the infection had occurred during the last few years the positive findings amounted to 25.9% for cattle and 12.5% for sheep.

Sterilized and non-sterilized faeces and urine of cattle were infected artificially with cultures of the organism and kept at room temperature, and the time of survival of the organisms was determined by culture and by animal inoculation. The survival time in non-sterilized faeces was 50 days, in sterilized faeces 30 days, in non-sterilized urine 15 days and in sterilized urine ten days. With 13 strains the survival time in tap water, distilled water, saline solution and cows' milk was investigated. 48-hour cultures in liver broth were mixed with the fluid to be tested in the proportion 1:4, kept at room temperature, and tested in intervals by subculture and animal inoculation. The strains did not differ much from one another in their resistance. They survived in water 15 days, in saline 40 days, in milk 35 days. In view of the frequent presence of the organisms in the faeces of healthy animals and of the limited time that they can survive outside the animal body, K. does not consider it necessary to have a prolonged quarantine for pastures on which sick animals have grazed.—A. MAYR-HARTING.

ANDREWES, C. H., & WELCH, F. V. (1946.) **A motile organism of the pleuropneumonia group.**—*J. Path. Bact.* 58. 578-580. 1308

A pleuro-pneumonia-like organism was isolated from lesions in the lungs of mice. In dark-ground preparations from broth cultures or from the condensation water of slants of Levinthal agar and horse serum a varying number of motile globules was present. Flagella could not be demonstrated; the mechanism of motility perhaps resembled that of motile myxobacteria. Motility was lost after several subcultures.

—A. MAYR-HARTING.

DIENES, L., & SMITH, W. E. (1944.) **The significance of pleomorphism in *Bacteroides* strains.**—*J. Bact.* 48. 125-153. 1309

A special strain of pleomorphic *Bacteroides* produces large bodies which develop either to a bacterial form or to an L type of growth, as described by KLIENEBERGER [see *V.B.* 5. 623]. It appears, therefore, that reproduction in this

group of bacteria is not necessarily covered by simple binary fission.

The morphology of the variants was studied in agar preparations. Various methods of obtaining suitable stained organisms are given. The description of development of large bodies is as follows :-

"In thioglycollate broth . . . the bacteria grew during the first hours in the form of short filaments which were partly segmented, partly non-segmented. Some of these filaments, examined after three hours' incubation, developed a small swelling in the center. After six hours' incubation, the bacillary filaments bearing a nodule were numerous, and at nine hours the majority of them had a large round swelling in the center. Between 18 and 24 hours in many cultures, no (or very few) regular bacterial forms were present. They were replaced by large bodies often connected with the remnants of the bacillary filament. In some cases the large bodies remained unchanged for several days; in others, bacillary forms reappeared and replaced the large bodies partly or entirely. Successive examinations of the broth cultures showed clearly that the large bodies developed by swelling of the bacteria."

Young broth cultures when transferred to solid media grow large colonies of regular bacilli, but from old cultures, a variable number of L type colonies are produced. A series of photographs illustrates the development of the two phases. The large bodies are capable of sub-division into smaller units, which in turn are gradually transformed into bacteria. In the course of division, a "nucleus-like" granule which is present in the large body and may be chromatin also divides, so that each daughter segment contains a well-stained granule. The L type, on the other hand, appears on the side of large bodies which do not usually segment. In the initial stages they are fine filaments or pleomorphic granules. They grow into the medium and multiply in a manner similar to that of the pleuro-pneumonia group. A single large body never produces both variants.

—R. E. GLOVER.

SCHUBERT, H. (1948-44.) Quantitative Bakteriologie. II. Mitteilung: Ueberlegungen und Versuche zur Hemmungswirkung physikalischer und chemischer Nährbodenfaktoren. III. Mitteilung: Tod und Hemmung des Bakteriums im Licht der Absterberkurven. IV. Mitteilung. Die Verflechtung von Akzeptor- und Soma-reaktion. [Quantitative bacteriology. II. Investigation into the inhibitory action of physical and chemical factors in nutrient media. III. Death and inhibition of bacteria in relation to the mortality curve. IV. The complexity of acceptor and soma reaction.]—*Zbl. Bakt. I. (Orig.)*. 149. 463-469, 150. 66-84 and 151. 358-368. [For part I, see *V. B.* 13. 36.] 1310

II. S. distinguishes between an acceptor substance and a somatic substance of the bacterial body. The acceptor is only a small part of the

bacterium, but is the centre of life. The soma is the bigger part of the bacterium. If it is damaged, while the acceptor is still intact, the bacterium may be inhibited, but is not dead. The author tries to make these assumptions plausible by means of physical and mathematical deductions applied to experiments with disinfectants added in various concentrations to nutrient media.

III. By means of mathematical deductions and calculations applied to his own and published experiments S. shows that the mortality curve of bacteria closely resembles the curve of a monomolecular reaction [already shown by CHICK in 1908], assuming that the death of a bacterium is effected when its molecule-like centre of life is hit. In contrast to this, inhibition is a partly reversible, multimolecular reaction subordinated to the former. The increase in the disinfecting power of two substances such as alcohol and iodine solution by emulsification is particularly explained as an increase of inhibiting effect.

IV. By means of mathematical analysis of various experiments with disinfectants published in the literature, S. tries to show that bacterial mortality depends on the simultaneous reactions, one of which is of a monomolecular character (acceptor reaction) while the other is of a multimolecular character (soma reaction). The effect of the complexity of the two reactions is dealt with in detail, with especial reference to the effect on tetanus spores of exposure to water vapour at different temperatures and pressures.—E. K.-N.

ELY, J. O. (1942.) Distribution of injected radio-activated bacteria in rats.—*J. Franklin Inst.* 234. 500-514. 1311

An account is given of the distribution of different species of bacteria following intravenous, intraperitoneal, intrathoracic and subcutaneous injection in the rat, as determined by the use of "radio-activated" organisms. The bacteria used were grown on agar slopes of broth to which had been added a small amount of radio-activated sodium phosphate (phosphorus being the radio-active element). After thorough washing, the organisms were suspended in saline for injection. At certain intervals, experimental rats were killed and the phosphorus was extracted from ashed tissues as magnesium pyrophosphate, the radio-activity of this salt being measured by means of a Geiger-Mueller counter. It was assumed that the relative distribution of the bacteria in the animal was the same as the distribution of the radio-active phosphorus.—E. COTCHIN.

STOKES, J. L., & GUNNESS, M. (1946.) The amino acid composition of microorganisms.—*J. Bact.* 52. 195-207. [Authors' summary copied *verbatim*.] 1312

The quantities of ten amino acids, namely, histidine, arginine, lysine, leucine, isoleucine, valine, methionine, threonine, phenylalanine, and tryptophane, were determined, microbiologically, in the acid or alkaline hydrolyzates of the dried cells of *Staphylococcus aureus*, *Escherichia coli*, *Bacillus subtilis*, *Streptomyces griseus*, *Saccharomyces cerevisiae*, *Rhodotorula rubra*, *Rhizopus nigricans*, *Aspergillus niger*, and *Penicillium notatum* grown under a variety of cultural conditions. It was found that the amino acid composition of an organism is, qualitatively and quantitatively, a stable and characteristic property of the cell under fixed conditions of growth. Although striking quantitative differences occur between microorganisms, the results, in general, emphasize the similarities rather than the differences in their amino acid composition. Certainly no funda-

mental differences in that some amino acids are present in one organism but not in another were encountered. The microbial proteins do not appear to differ materially from plant and animal proteins, represented by wheat and beef liver. Fungi contain 10 to 50 per cent. less, per unit of protein, of most of the amino acids determined than do the other microbial groups. Mold mycelium prior to sporulation, compared to that after sporulation, contains considerably larger quantities of most of the amino acids largely because of its 50 per cent greater protein content. The mycelium and its spores, in general, have comparable amino acid contents. The quantities of individual amino acids in microorganisms may vary with the growth medium, aeration, and age of the cells.

See also absts. 1325 (actinomycetes in cow pox lesions), 1328 (*Bact. coli* bacteriophage), 1422 (action of high frequency currents), 1424, 1426, 1427 (antibiotics), 1432-1434 (inhibition of tubercle bacilli), 1449 (*Br. abortus* in fistulous withers), 1450, 1451 (disinfectants), 1454 (pathogenic bacteria in cheese), 1474 (mastitis).

DISEASES CAUSED BY PROTOZOAN PARASITES

DELPY, L. (1946.) Protozoaires observés en Iran dans le sang des animaux domestiques. [Blood protozoa of domestic animals in Persia.]—*Bull. Soc. Path. exot.* 39. 122-126. 1313

This is a preliminary note enumerating the protozoa found in the blood of domestic animals in Persia in the period 1931-35. Seven species of *Babesia*, two of *Theileria* and two of *Anaplasma* are listed. Trypanosomes morphologically identical with *T. evansi* have been found in camels. *Eperythrozoon* spp. are found in sheep and calves. Parasites tentatively classified as *Bartonella* or *Grahamella* have been observed in the blood of calves and *Aegyptianella pullorum* has been seen in poultry.—D. LUKE.

RIDLEY, H. (1945.) Ocular lesions in trypanosomiasis.—*Ann. trop. Med. Parasit.* 39. 66-82. 1314

From ophthalmic examination of 215 West Africans with sleeping sickness, it is concluded that inflammation of the eye due to trypanosome invasion is rare; no such invasion has yet been demonstrated microscopically. Human beings differ in this respect from infected dogs in which microscopic examination reveals trypanosomes in both the vitreous and aqueous fluids. In man ocular abnormalities, the commonest being papilloedema, occur in uncomplicated trypanosomiasis but are secondary to infection of the meninges and central nervous system. Onchocerciasis often occurs concurrently with trypanosomiasis and is important ophthalmologically. The risk of amblyopia and amaurosis from arsenic therapy is serious.

The factors leading to damage of the eye by arsenicals are discussed, and it is suggested that the stability of tryparsamide as compared with other drugs is only relative and that its composition undergoes some change unless used shortly after manufacture. The purity of the drug and of the distilled water in which it is dissolved may also be important.—U. F. RICHARDSON.

HUNT, A. R., & BLOSS, J. F. E. (1945.) Tsetse fly control and sleeping sickness in the Sudan.—*Trans. R. Soc. trop. Med. Hyg.* 39. 43-58. 1315

An account is given of the application of the "block" system to the Tembura sub-district of the southern Sudan, in an attempt to reduce the number of *Glossina palpalis* and the incidence of sleeping sickness. Early measures of control had consisted in the concentration of the population along roads on the watershed and the clearing of road-river crossings, but though sleeping sickness declined from 1923-36, an increase then became apparent and did not yield to a more vigorous application of the old control measures. It is noted that *G. morsitans* occurred in the area and that two cases of *Trypanosoma rhodesiense* infection had been detected in 1926, but that the fly seemed to leave the roads area with the replacement of mules and horses by motor cars and the dispersion of game by the concentration of population.

Under the "block" system the upper reaches of the Yubu river, from which the majority of sleeping sickness cases seemed to come, was divided into five "blocks" by barrier clearings,

and fly catching was systematically carried out within the blocks. Under this system a reduction in the tsetse population was achieved and infections from the Yubu river valley dropped from 65 in 1938 to three in 1942.—U. F. RICHARDSON.

JONES, H., RAKE, G., & HAMRE, D. (1944.) **Cultivation of leishmania in the yolk sac of the developing chick embryo.**—*Amer. J. trop. Med.* 24. 381–383. 1316

Strains of *L. donovani*, *L. braziliense* and *L. tropica* were cultivated in the yolk sac of the developing chick embryo, *L. donovani* being maintained for 81 passages. Chick embryos of 6–9 days' incubation were most suitable. The optimum temperature for leishmania cultivation appeared to be 23°–28°C., at which 97% of the embryos died in 3–5 days.

The organisms appeared to multiply in the yolk sac as leptomonads and also invaded the yolk cells, where they multiplied both as leptomonads and as Leishman-Donovan bodies, but the yolk sacs did not become infective to hamsters.

—U. F. RICHARDSON.

RODHAIN, J., & DELLAERT, R. (1943.) L'infection à plasmodium malariae du chimpanzé chez l'homme. Etude d'une première souche isolée de l'anthropoïde *Pan satyrus* verus. [**Infection of human beings with *P. malariae* from chimpanzees.**]—*Ann. Soc. belge Méd. trop.* 23. 19–46. [Flemish summary.] 1317

A strain of *P. malariae* isolated from a naturally infected chimpanzee from the Belgian Congo was studied in a series of 14 passages through human beings, in the course of which intravenous inoculations of 5–9 ml. of infected blood were made into patients with general paralysis.

Twenty-two such patients were inoculated and all became infected, 15 with symptoms of quartan malaria (minimum temperature 99.5°F.) and five with irregular symptoms. Three of the 22 died, two from concurrent infections and the third from cardiac collapse resulting from the fever. The average period of incubation was nine days. Infection was characterized by the small number of parasites in the blood and a corresponding diminution of red corpuscles and haemoglobin standard. There was leucopenia typical of malarial infection, and relative monocytosis.

The strain used was especially suited for therapeutic inoculation because it produced only low parasitaemia and had high pyrogenic power. Its virulence did not appear to be enhanced by passage through man.—S. M. G.

ANON. (1946.) **Notes on animal diseases. I. Red-water and anaplasmosis.**—*E. Afr. agric. J.* 12. 53–58. 1318

Babesia bigemina is said to be the only protozoan parasite causing redwater of cattle in Kenya and there is no evidence of more than one immunological strain in Africa. The most important vector is stated to be *Boophilus decoloratus*, infection passing through the egg both in this tick and in *Rhipicephalus bursa*. *Anaplasma marginale* is the common strain of parasite involved in anaplasmosis. The symptoms are said to resemble those of redwater, except that red urine is not passed. Death may occur in the acute stage, or later from anaemia. In calves reared under ranching conditions, the disease is very mild. Hereditary transmission has been proved to occur only in some *Boophilus* spp., *Rhipicephalus simus* and *Ixodes ricinus*.

No specific drugs are available for anaplasmosis, but preliminary reports suggest that transfusion of blood from a healthy ox may be valuable, though this is not recommended in Kenya, as it may allow transmission of other parasites. Filling the stomach daily with water may also be valuable in treatment. Dipping at 5–14 days' interval is recommended to prevent infection, and the practice of leaving calves undipped so that they may acquire immunity is condemned as perpetuating ticks. Infection of the calves can be produced by inoculation.

The method of immunizing with *A. centrale* is described. Imported cattle are inoculated first with *A. centrale* and later with *B. bigemina* and *A. marginale*. Cattle undergoing immunization should be kept free from ticks.—U. F. R.

I. GSELL, O., & RIMPAU, W. (1944.) Endemisches Feldfieber in der Schweiz. [**Endemic leptospirosis in Switzerland.**]—*Münch. med. Wschr.* 91. 117–120. 1319

II. GOE. (1944.) Endemisches Feldfieber in der Schweiz durch Schweine übertragen? [**Is "endemic field fever" of man in Switzerland Transmitted by Pigs?**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* April 28th. 146–147. 1320

I. A leptospiral infection was demonstrated by serological examination in 18 out of 34 persons with "field fever" in St. Gallen Canton, Switzerland. Nine species were used in each test, viz., *L. grippo-typhosa* (field fever type A), *L. sejro* (field fever type B), *L. australis* A (field fever type C), *L. pomona* (field fever type D), and *L. canicola*, *L. icterogenes* [= *L. ictero-haemorrhagiae*], *L. autumnalis*, *L. bataviae* and *L. poi*. The 18 positive results were classified as 12 of type A, two of type B, one of type C and three of type D. The affected persons were engaged in agricultural work and the disease was most common in summer and autumn. The clinical picture was marked

by fever, headache, stiffness of the neck and back and other symptoms suggesting some degree of meningitis. Serological examination of 65 swine coming to abattoirs in St. Gallen showed that 15 had a significant titre for *L. pomona*, while 15 out of 84 swine in Munich had only a low titre against *L. icterohaemorrhagiae*. An examination was also made of sera from field mice, four out of 47 having a high titre against *L. grippo-typhosa*.

The authors are of the opinion that "field fever" is, in fact, a leptospiral infection and they also suggest that meningitis of swine may not be a pure virus infection but may be a mixed virus and leptospiral infection or even a pure leptospiral infection. In view of these conclusions they stress the importance of considering a similar aetiology in "swineherds' disease".

II. This is an annotation commenting on the work of GSELL & RIMPAU [see I above]. The resemblance is stressed between "field fever" and "swineherds' disease", as met with in other parts of Switzerland, and the opinion is expressed that leptospira may be of some significance in the aetiology of swineherds' disease.—W. M. H.

I. GSELL, O. (1944.) Die Schweinehüterkrankheit (Meningitis porcinarum). [Swineherds' disease.]—*Schweiz. med. Wschr.* 74. 247. 1321

II. GSELL, O. (1945.) La maladie des porchers, une leptospirose pomona. [Swineherds' disease caused by *Leptospira pomona*.]—*Pr. méd.* Sept. 29th. 525-526. [See also absts. preceding.] 1322

I. A brief note. G. discussed the illness occurring in pigs with which swineherds' disease may be related. The symptoms associated with the condition are described vaguely as "off feed", bowel derangement, weakness of limbs and convulsions. G. recommended a change of diet and treatment with cod liver oil to alleviate the condition.

II. G. considers that swineherds' disease is due to *L. pomona* infection. In 1944 he found that in eight affected persons the blood serum agglutinated leptospira (in a group reaction) after the second week of illness, whereas there was no such agglutination earlier; moreover, the strength of the reactions increased up to the second month after the beginning of the illness. During the first weeks of illness the blood was infective to human patients to whom it was given as a measure of pyretotherapy, causing illness with high fever and the production of antibodies to leptospira (a group reaction). Similar agglutinins were also present in the cerebro-spinal fluid of the persons inoculated from them and the cerebro-spinal fluid was infective after the first week of illness.

Thirty-nine persons in whom *L. pomona* infec-

tion was diagnosed all had close contact with pigs, being workers in cheese factories or swineherds. Six cases diagnosed as *L. pomona* meningitis occurred in butchers, as a result of abattoir infection; infection from rural sources, in particular from mice and rats, was excluded. Two masons who had done repair work at a piggery and a lorry driver who had transported pig food were the only persons of other occupation who contracted the disease. Agglutination-lysis tests were carried out in collaboration with Wiesmann at a speal leptospira station, with "*L. icterogenes*" (*sic*), *L. icterohaemorrhagiae*, *L. grippo-typhosa*, *L. sejro*, *L. Australis A*, *L. pomona*, *L. autumnalis* and *L. canicola* strains at their disposal from RIMPAU's laboratory.

In 82 persons who had recently had swineherds' disease there was an agglutination titre for *L. pomona* of more than 1:1,000 and in seven the reaction lasted for a long time after recovery, in one case at a titre of 1:100 after 11 years. *L. pomona* was isolated in culture from an unspecified source from one case.

A pig inoculated with GSELL's strain of *L. pomona* remained healthy but, at the sixth day, the blood had a high agglutination titre and, at the 14th day, there was intense "leptospiuria".

In serological tests on 173 pigs from different parts of Switzerland in which swineherds' disease had occurred, 65% yielded positive agglutination reactions at 1:100 and 30% at 1:1,000. Leptospira were found in the urine of two apparently healthy pigs of those areas. The blood of pigs from areas in which swineherds' disease is unknown has yielded negative reactions.

All who worked on the disease noted that there was no characteristic symptom of illness in pigs in infected premises. G. considers that these results indicate that pigs are carriers of *L. pomona* infection and that human beings become infected from pigs.

He considers that the human infection is acquired through the skin, from contact with urine of pigs or excretions that have been contaminated with such urine. In G.'s experience, infection occurs in rural workers who walk about bare-footed and in butchers, with injuries to the hands.

JENNY, J., & KANTER, U. (1946.) Über Leptospirosen. I. Mitteilung. Ein Seuchenzug von Stuttgarter Hundeseuche in Zürich 1944/45. [Leptospirosis. I. An outbreak of Stuttgart disease (swineherds' disease) in dogs in Zurich, 1944-45.]—*Schweiz. Arch. Tierheilk.* 88. 161-181. 1323

The distribution of the various species of *Leptospira* in Europe is discussed, particular atten-

tion being drawn to *L. pomona* infection of swine. An outbreak of Stuttgart disease of dogs which occurred in Zurich in 1944-45 is described. 187 dogs were involved, the first cases occurring in June, 1944, with a peak in November (25 cases), a sudden decline in January, 1945, (seven cases) and a low incidence of cases during the rest of that year. Cold did not apparently affect the epizootic as 21 cases occurred in December, 1944, but the decline in January might have been due to the snow-fall. No information was obtained as to the source or spread of the infection. Neither human beings, rats, mice nor biting insects appeared to be involved. Infection of males exceeds that of females by 2:1; it has been suggested that the habit of the male dog of smelling urine may be responsible, but attempts to produce cases by contact failed and it is pointed out that in human leptospirosis male cases also predominate. Attempts to produce disease by the inoculation of blood, tissues or cultures also failed, although inoculated animals developed agglutinins for *L. canicola*.

Leptospira could be cultured from the blood on Korthoff's medium between the fourth and seventh days and agglutination tests first became positive between the seventh and 14th days, with a titre of 1:200 to 1:500, rising later to 1:1,000 or more. Eighteen out of 79 sera agglutinated *L. canicola* only, but others also gave a weak agglutination with *L. icterohaemorrhagiae*.

See also absts. 1436 (drug-fast trypanosomes), 1437 (leishmaniasis), 1438 (fowl malaria), 1471 (piroplasmiasis and trypanosomes).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

HARDENBROOK, H., Jr. (1946.) *Studies in cow-pox. III. A note on the fungal flora of bovine teat and udder lesions.*—*Cornell Vet.* 36. 251-258. [For part II, see *V. B.* 13. 89.] 1325

A pox-like disease of the udder and teats was found to be due to an unnamed species of *Actinomyces*, with which cases of the disease were produced experimentally. The fungal flora isolated from the lesions is recorded. Mastitis did not develop following udder transfusions with actinomyces spore emulsions.—S. J. GILBERT.

NIEMAND, H. G. (1944.) Hundestaupé. [Dog distemper.]—*Z. Veterinärk.* 56. 211-221. 1326

The clinical features and treatment of distemper are discussed. The symptoms are often not clear, diagnosis is difficult and the prognosis is often unfavourable. The lesions of the virus disease are not serious, but the weakened generalized resistance favours secondary bacterial infection. In secondary broncho-pneumonia administration of large doses of sulphonamides for 2-3 weeks is useful.

Treatment with hexamine, bismuth subnitrate, sulphonamides, neoarsphenamine, "leptosprits", yaten vaccine, "bismogenol", acriflavine and by intravenous injection of formalin was unsatisfactory. Some success was obtained by the subcutaneous injection of penicillin and it is recommended that further work be carried out on the value of this substance. In one case, death followed the intravenous injection of penicillin; this was ascribed to the absorption of toxins liberated by killed leptospira.—U. F. RICHARDSON.

WYLIE, J. A. H. (1946.) *The relative importance of the renal and hepatic lesions in experimental leptospirosis icterohaemorrhagica.*—*J. Path. Bact.* 58. 351-358. [Author's summary copied verbatim.] 1324

Necrosis of the liver is an inconstant feature of experimental leptospirosis icterohaemorrhagica in the guinea-pig.

The administration of additional methionine produces a statistically significant reduction in the incidence of liver necrosis.

The degree of liver damage present fails to influence the intensity of the jaundice or the time of survival of the animal after inoculation.

A renal lesion comprising severe congestion of the glomeruli and destruction of the tubular epithelium is a constant feature of the disease and death appears to be due to renal failure irrespective of coexistent liver damage.

Secondary infections, such as gastro-enteritis, conjunctivitis, rhinitis, keratitis, otorrhoea, tonsillitis, nephritis, cystitis, vaginitis and toxic disturbances of the heart can be usually treated successfully; the nervous conditions resist all treatment. The article contains a useful bibliography.—C. AHARONI.

REAGAN, R. L., LILLIE, M. G., POELMA, L. J., & BRUECKNER, A. L. (1947.) *Transmission of the virus of Newcastle disease to the Syrian hamster.*—*Amer. J. vet. Res.* 8. 136-138. 1327

Newcastle disease virus was passaged intracerebrally 12 times in Syrian hamsters. Symptoms of irritability appeared after an incubation period of 3-6 days. This was followed by malaise, paralysis, laboured breathing and death within 18 hours. Approximately a third of injected hamsters failed to show symptoms. Neutralizing antibody was demonstrated in the sera of one hamster. Virus of the fifth and eighth hamster passage was neutralized by convalescent but not by normal chicken serum.—F. D. ASPLIN.

FISCHER, G. (1946.) Studies on bacteriophage of various strengths with special regard to its effect on *B. coli* in transmigration culture.—*Acta path. microbiol. scand.* 23. 60-79. [In English.] 1328

F. studied the effect of bacteriophage on *Bact. coli* in semi-solid agar, using tubes 300 mm. in length filled with 0.2% nutrient agar. This agar concentration was found not to inhibit the phage. Two media, differing in the brands of beef extract and peptone and in their pH were used and inoculations were made on to the top surface of the agar column.

If the inoculum was *Bact. coli* without phage, two discs of denser growth developed which moved downwards through the medium, leaving a thin turbidity in their wake.

With a strong concentrated phage no growth became visible. With a phage suitably diluted, or attenuated by heating at 70°C. for 8-18 min., the discs and a slight turbidity developed, but they were dissolved and in their place dense granules developed, the medium between them remaining clear. In one medium a turbidity with secondary discs developed at the lower end of the granular area and these discs subsequently travelled upwards respectively through the medium. Organisms from the secondary discs differed from the original culture by an increased resistance to phage action and to some degree also in their fermentative activity. The granules consisted microscopically of closely interwoven chains of bacteria; a suspension of these forms in broth dissolved rapidly, and no growth occurred in the broth till

after 1-3 days, when phage-resistant organisms developed. The bacteria growing in granules under the influence of the phage seemed to be more sensitive to phage action than the original culture, a phenomenon which has not been recorded so far; possibly the agar affords some physical protection against the phage and the density of growth in the granules may enhance this effect.—A. MAYR-HARTING.

HENDERSON-BEGG, A., & FULTON, F. (1946.) The standardisation of a scrub typhus vaccine.—*J. Path. Bact.* 58. 381-389. [Authors' summary copied verbatim.] 1329

During the large-scale manufacture of a scrub typhus vaccine from cotton rat lungs, it was necessary to find some method of standardizing the batches of vaccine produced. Owing to the peculiar difficulties of the process it was not possible to devise a direct test of the immunizing potency and so it was decided to depend on an estimate of the rickettsial content.

The rickettsiae in the cotton rat lungs were assessed by examining stained impression smears, and calculating a numerical value based on the degree of parasitisation of the susceptible cells and on the number of extracellular organisms.

The rickettsial content of the vaccine was estimated by a direct counting method, and also by measuring the amount of specific complement-fixing antigen.

New staining techniques were used both in the routine preparation of impression smears and in the method used for enumerating rickettsiae in the vaccine.

See also absts. 1276 (bacteriophage), 1319-1323 (swineherds' disease), 1336 (fowl sarcoma), 1358 (congenital defects following maternal infection), 1422 (action of high-frequency currents), 1439 (influenza virus), 1471, 1472 (rinderpest).

IMMUNITY

HARRINGTON, C. R. (1944.) The contribution of chemistry to immunology. Jubilee Memorial Lecture.—*Chem. & Indust.* No. 10. pp. 87-91. 1330

This lecture deals with the nature of antigens,

particularly with artificial antigens made by combining simple chemical substances to proteins. The chemical problems of sensitivity to simple chemical compounds as illustrated by the explosive tetryl are discussed.—E. BOYLAND.

See also absts. 1289 (vole bacilli vaccine), 1302, 1304 (brucella vaccines), 1329 (scrub typhus vaccine), 1334 (avian lymphomatosis).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SALT, R. W. (1944.) The effect of subzero temperatures on *Hypoderma lineatum* DeVill.—*Sci. Agric.* 25. 156-160. 1331

All naturally dropped larvae and developing pupae and imagines in puparia survive low temperatures which do not freeze them. Both the freezing point and the death point are about -24°C., rarely reached in South Alberta after early March. Although warbles were noted to leave

cattle as early as February these were all non-viable immature specimens. It was not until mid-March that fully developed larvae were dropped, when all danger of their freezing was past.—T. S.

OJEMANN, J. G. (1946.) Demodicosis. [*Demodex infestation.*]—*Tijdschr. Diergeneesk.* 71. 153-159. [English and French summaries.] 1332

O. observes that follicular mange in dogs has

increased in the Netherlands during the past three years. His data as to the incidence of canine diseases and other factors suspected of predisposing young dogs to demodicosis show that such diseases as distemper, eczema and rickets and such conditions as bad hygiene, feeding and too little or too much attention to the skin are of little importance in the spread of the disease.

O. obtained excellent results with the use of nicotinamide in skin affections such as acanthosis nigricans and the related eczema without pig-

mentation in cases of pruritus and for stimulation of hair growth: he therefore tried it on young dogs infected with *Demodex* and found it excellent. He claims that young dogs probably have a relative deficiency of nicotinic acid. It is also pointed out that little is known of the functions of this vitamin. A nicotinic acid deficiency in older dogs is manifested by "black tongue". He concludes that the endogenous factor of demodicosis may be a partial nicotinic acid deficiency and that further investigation is necessary.—P. L. LE ROUX.

See also absts. 1294 (vectors of plague), 1315 (tsetse fly), 1318 (transmission of babesia), 1440, 1441 (D.D.T.), 1442 (sheep scab).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

OPPENHEIM, J. M., & WHIMS, C. B. (1946.) **Clinical and laboratory observations on 256 cases of trichinosis.**—*Bull. U.S. Army med. Dep.* 6. 581–598. [Authors' summary copied verbatim.] 1333

Two hundred and fifty-six cases of trichinosis resulting from ingestion of raw pork were hospitalized and studied. With the exception of two cases, all patients returned to their occupations within 6 weeks of the time of the onset of the disease. Treatment was entirely symptomatic. There were no fatalities.

Eosinophilia was the most reliable and significant laboratory finding. Generally, the percentage of eosinophilia was inversely related to clinical severity. In cases showing low admission eosinophil counts, clinical improvement was

See also abst. 1456 (liver fluke).

paralleled by rapidly rising eosinophilia. Eosinophilia persisted at a high level in a group of 33 patients whose blood was examined at 10-day intervals over a period of 40 days.

Transient electrocardiographic changes occurred in 5 patients of a group of 33 who had serial electrocardiograms taken at 10-day intervals over a period of 40 days.

Parasites could not be demonstrated in the stools, blood, duodenal contents, or spinal fluids of limited groups of patients.

Muscle biopsies in 18 cases done within 45 days of onset of illness were negative for free or encysted larvae. Muscle biopsies done on 18 patients 1 year after onset of illness revealed 1 case showing encysted larvae and 5 showing muscle fibrosis.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

OLSON, C., JR. (1945.) **Immunization against a lymphoid tumor of the chicken. II. Use of centrifuged material. III. Attenuation by heat, drying and chemicals.**—*Cornell Vet.* 35. 308–313 and 36. 41–47. [For part I, see *V. B.* 16. 438.] 1334

II. Following the observation that lymphoid tumour pulp induces strong resistance against subsequent inoculations of the same tumour, O. tested the activity of the supernatant fluid derived from centrifuged tumour material in chickens with simultaneous injection of (a) minced tumour pulp and (b) centrifuged supernatant fluid, followed later by active minced tumour pulp.

In only one case did the supernatant fluid produce a growth, probably as a result of the accidental inclusion of viable tumour cells. Supernatant fluid of centrifuged lymphoid tumour pulp did not have an immunizing effect when devoid of the capacity to produce growth.

III. In a further communication O. describes experiments designed to test the immunizing power of heated tumour pulp. The material was subjected to heat in a water-bath at temperatures varying between 60°C. and 100°C. The former temperature only moderately reduced the growth capacity, whilst the latter destroyed it. The immunizing ability of pulp heated to 60°C. was retained, but the pulp heated to 100°C. had no immunizing properties.

The tumour was relatively resistant to heat, as it was not completely inactivated by exposure to 70°C. for 15 min.

Dried tumour, necrotic tumour and tumour treated with phenol or formaldehyde were inactive and did not induce resistance.

—JOHN G. CAMPBELL.

DURAN-REYNALS, F. (1946.) **On the transplantability of lymphoid tumors, embryonal nephromas and carcinomas of chickens.**—*Cancer Res.*

6. 545-552. [Author's summary copied *verbatim.*] 1335

Transplantation of 12 lymphoid tumors under the same conditions that insured indefinite transplantation of some sarcomas failed entirely. Two epithelial neoplasms could not be transplanted.

Ten embryonal nephromas are described. One of them was carried through a passage in one chick where it grew much as a sarcoma. Another was probably transplanted as a fibroma. The sarcomatous growths accompanying a third case were transplanted indefinitely as sarcomas, and a causative virus was demonstrated even in the original growths.

Since unmistakable metastases of the embryonal nephroma occurred in at least 3 cases and in one of them there were also present sarcomatous growths we must consider the possibility that the transplantable infectious sarcomas may have been metastases of the embryonal nephroma. The factors that seem to govern the transplantability of all spontaneous chicken neoplasms are discussed.

DURAN-REYNALS, F., & SHRIGLEY, E. W. (1946.)

A study of five transplantable chicken sarcomas induced by viruses.—*Cancer Res.* 6. 535-544.

[Authors' summary copied *verbatim.*] 1336

Five sarcomas spontaneously developing in chickens have been carried through this species in a number of passages by inoculation of cells, and they may be considered as indefinitely transplantable. Four of them were found in chickens of from 5 to 10 months of age; the fifth, in a chicken 18 months old. All had induced metastases in the original host. A causative virus has been demonstrated in each of the tumors, in one case in the original growth itself.

In 4 of the lines hemorrhagic disease developed at the same time that free virus was demonstrated in cell-free preparations. In the fifth tumor, a slow-growing fibrosarcoma, the virus never induced hemorrhagic lesions although not infrequently metastases were present. Although the tumors can be classified as to certain common properties, each of them has typical features that justify the statement that no two of them are identical. Each of them raises different problems, which are discussed.

STRONG, L. C., & FIGGE, F. H. J. (1946.) **The effect of diets containing an abundance of milk, liver, riboflavin, and xanthine on methyleholanthrene carcinogenesis.**—*Cancer Res.* 6. 466-469. [Authors' summary copied *verbatim.*] 1337

A diet of liver supplemented by combinations of raw, unpasteurized milk, riboflavin, and xanthine had little or no influence on the latent period or growth rate of tumors induced in C₃H mice by the subcutaneous injection of 1 mgm. doses of methyleholanthrene. In general, the diet

supplements stimulated tumors at first and later seemed to have a slight inhibitory effect. This effect was most pronounced in the group of mice receiving raw milk and riboflavin in addition to the basic dried liver, milk, Nurishmix diet. In any case, the effect of diet was so slight that its significance was questionable. This is in contrast to the remarkable inhibition of the carcinogenic action of *p*-dimethylaminoazobenzene observed by other investigators when adequate amounts of yeast, liver, or milk are added to the diet.

HOCH-LIGETI, C. (1946.) **Effect of fresh milk on the production of hepatic tumors in rats by dimethylaminoazobenzene.**—*Cancer Res.* 6. 563-573. [Author's summary copied *verbatim.*] 1338

The addition of 10 ml. of fresh milk daily to a rice-carrot diet containing 0.06 per cent of *p*-dimethylaminoazobenzene protected rats to a considerable extent from the development of liver tumors. In one group of 50 animals 2 incipient growths were found on the 410th and 460th days respectively; in a second group (30 animals) tumors were found on the 161st day, on the 262nd day and on the 378th and 386th days respectively.

The addition of 6 per cent of casein to the rice-carrot diet with 0.06 per cent of *p*-dimethylaminoazobenzene did not prevent the formation of tumors, 78 per cent of the animals killed after the 90th day having had hepatic neoplasms.

The food intake of the animals decreased on the diet containing milk when *p*-dimethylaminoazobenzene was given. The body weights of the males were slightly lower than those of the controls receiving no *p*-dimethylaminoazobenzene. However, no difference in the weights of females was observed.

The food intake of the rats on rice and carrots or rice, casein, and carrots with or without *p*-dimethylaminoazobenzene was about the same, and was about half as great as that of animals on a diet supplemented with milk. The body growth stopped; animals receiving *p*-dimethylaminoazobenzene lost weight slightly.

In all groups of rats receiving *p*-dimethylaminoazobenzene the spleen was enlarged. In the same groups the individual rats that developed tumors had smaller spleens than had those without tumors.

The free HCl in the stomach generally disappeared in animals on diets producing tumors, but this did not occur in all animals that developed tumors.

Some rats on the rice-casein diet developed papillomatosis of the forestomach, the tendency to which was increased by the administration of azo dyes.

Possible dietary influences on the develop-

ment of primary liver cancer in some native peoples of Africa and Asia are discussed.

SILBERBERG, M., & SILBERBERG, R. (1946.) **Course of wound healing in the skin of mice under the influence of carcinogens.**—*Arch. Path.* 42. 193–205. [Authors' summary copied *verbatim*.] 1339

The inhibition of the epithelization of wounds made in the skins of young mice treated with 2, 4-benzpyrene or 20-methylcholanthrene for two or three months previous to the making of the defects is temporary. The regenerating epithelium overcomes the forces opposing its migration as it advances into the wound at the end of the second or the beginning of the third week of healing. Coinciding with the epithelization of the defect is a fall in the mitotic activity in both the old marginal and the new regenerated epithelium. This tendency of the epithelium to return to a resting state is considered the reason that, under the present experimental conditions, no correlation was noted between the former site of the wound and the place of tumor formation.

OPIE, E. L. (1946.) **Mobilization of basophile substance (ribonucleic acid) in the cytoplasm of liver cells with the production of tumors by butter yellow.**—*J. exp. Med.* 84. 91–106. [Author's conclusions copied *verbatim*.] 1340

Butter yellow (dimethylaminoazobenzene) causes degenerative changes in liver cells accompanied by chromatolysis of cytoplasmic structures that stain with basic dyes because they contain ribonucleic acid. These changes are profoundly modified by the protein content of the diet.

Chromatolysis is succeeded by focal regeneration with reaccumulation of ribonucleic acid in the cytoplasm of liver cells; these foci of basophile hyperplasia have their origin in the parenchyma surrounding portal spaces and consist of cells arranged in columns or as tubules with lumina.

Hepatomas arise from foci of basophile hyperplasia and corresponding with the arrangement of cells in these foci may be trabecular or adenomatous.

Butter yellow causes new formation of bile ducts which arise chiefly in the immediate neighborhood of secondary portal spaces and produce the precancerous lesion, designated cholangiofibrosis. These bile ducts may accumulate ribonucleic acid in their cytoplasm and undergo hyperplasia.

Cholangiomas arise from newly formed bile ducts that are the site of basophile hyperplasia.

Changes accompanying chromatolysis and basophile hyperplasia aid in the definition of structural elements of the cytoplasm and in the localization of ribonucleic acid with relation to the mitochondria.

DUNNING, W. F., CURTIS, M. R., & SEGALOFF, A. I. (1946.) **Methylcholanthrene squamous cell carcinoma of the rat prostate with skeletal metastases, and failure of the rat liver to respond to the same carcinogen.**—*Cancer Res.* 6. 256–262. 1341

Pellets of methyl cholanthrene, implanted into the prostates of six-month-old rats, induced prostatic cancer in 11 out of 26 animals. Implantation of methylcholanthrene into the livers of rats did not induce hepatomas.—E. BOYLAND.

DISEASES [NON-INFECTIVE] OF BREEDING STOCK

MILOVANOV, V. K., & SMIRNOV-UGRYUMOV, D. V. (1944.) **Osemenenie sel'skokhozyaistvennykh zhivotnykh. [Artificial insemination of domestic animals.]** pp. 100. Moscow: Sel'khozgiz. 8vo. 1342

The good results obtained in the improvement of livestock in the U.S.S.R. by selection and inbreeding are briefly discussed. The possible danger of such a policy is pointed out and illustrated by the case of the Mazoev breed of sheep, which was noted for length of wool. Over concentration on this good quality resulted in the skin becoming too thin for manufacturing processes and it was necessary to introduce an outcross. The advantages of artificial insemination are that the health and fertility of the bulls are under constant observation and that each sire a greater number of progeny. It is claimed that

10–15 cows and 20–30 ewes may be inseminated by one ejaculate. Cross breeding is of value for some purposes and is permitted on certain collective farms. Since April, 1943, natural mating with approved sires has been permitted on some collective farms, but in others sires are reserved solely for artificial insemination. Where natural mating is in use it is recommended that the bulls be allowed to run with the cows on alternate days. Where there is TB., trichomoniasis brucellosis or infectious vaginitis on a farm, natural mating is not permitted.

Experimentally it was shown that within 15–40 days an inadequate diet affected the semen: for a whole month before use, therefore, donors have a carefully regulated diet. Their condition should be well above the average: rams, in particular, should be slightly on the fat side, as during

semen collection they often lose weight. If more than two collections of semen are obtained daily, diet should be increased 10–20%. In the case of the ram, a very concentrated diet is suggested, comprising large quantities of proteins and vitamins and even including milk and raw eggs (up to six per day). A fortnight before semen collecting the ram is gradually placed on a more normal diet.

Particular attention is paid to the management of the bulls and diet, exercise and work are carefully regulated. Thorough grooming, including occasional washing, is insisted upon. These bulls are sometimes used for light farm work, such as ploughing or carting light loads; this is particularly beneficial if the animals are inclined to get fat. If fat animals tend to get lazy, compulsory exercise is enforced. Temperament and the sexual reflexes of each individual are taken into consideration, and it is emphasized that quiet but firm handling of the bull is essential; any tendency to wild behaviour should be corrected at the start. It is even suggested that when the donor is led away after semen collection, some tasty food should be allowed, so that it associates reward with service. Beating or rough handling, particularly before semen collection, is prohibited.

Special care of the females to be inseminated is also taken, with great attention being paid to the diet, particularly its vitamin content. All animals, whether to be used as donors or recipients, are examined beforehand to exclude infection.

For collection of semen the artificial vagina is used and the usual precautions as to cleanliness, etc., are emphasized. Particular attention is paid to the examination of each quantity of semen collected, as the age, health, diet, time of year and the number of collections made can all alter the quality of each ejaculate; motility of the sperm is taken as the best index of fertility. Field and laboratory examinations are recommended. For storage and transport of semen to be used immediately or within three hours, no special precautions are necessary unless the weather is cold, when it must be protected from sudden falls of temperature. If the semen is to be used after a longer interval, cooling is adopted as the best method of preservation. The ejaculates of bulls, rams and goats are generally stored undiluted; in the case of the boar a special diluent is added.

The artificial insemination centre is managed by three people. Great care is taken to investigate the heredity of all donors.

The book is very detailed and includes considerable physiological data, one chapter being devoted to the physiology of reproduction and including several diagrams and illustrations of the female genitalia of the various species.—O. U.

BARRETT, G. R., & CASIDA, L. E. (1946.) **Time of insemination and conception rate in artificial breeding.**—*J. Dairy Sci.* 29. 556–557. [Only abstract given: slightly amended.] 1343

Owners of cows bred in the Wisconsin Experimental Breeding Project are asked to report the hour at which cows are first noticed in heat. This time and the time of breeding are recorded by the inseminator. Such information is available on 3,841 inseminations made during the periods from January 24 to May 31, 1945, and from August 13, 1945, to January 31, 1946. These have been grouped, according to the length of interval from notice of heat to time of insemination, into the following classes: less than 3 hours; 3 but < 6; 6 but < 9; 9 but < 16; 16 but < 20; 20 but < 25; 25 or more hours. The percentages of conception for the above groups are, respectively, 46.3, 55.8, 54.0, 53.5, 54.4, 50.5, 43.6 per cent, while the average for the entire group is 52.4.

HUSTIU, N. C. (1943.) Ricerche sulla vita sessuale e sulla fecondazione artificiale delle pecore di razza Karakul e Tzurcana. [**Artificial insemination in Karacul and Tzurcana sheep.**]—*Anal. zootech. Inst. Român.* 9. 65–100. [In Italian.] 1344

H. considers that better samples of semen are obtainable from rams by electrical stimulation than by the use of an artificial vagina. He gives details of the method of collection using an electro-ejaculator, with one electrode in the rectum and the other applied to the skin of the lumbar region. The handling, storing and dispatch of semen are described. Good results were obtained in semenating ewes of the Karakul and Tzurcana breeds.—R. MACGREGOR.

*BONADONNA, T., & RIMOLDI, A. (1941.) Osservazioni sulla fecondazione artificiale delle galline con sperma diluito e conservato. [**Artificial insemination of hens.**]—*Riv. Avicult.* February. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* May 28th. 169. (1943).] 1345

The results of inseminating groups of 12 hens with 0.1 ml. of semen were: with fresh undiluted semen 70%, with fresh semen diluted 1:1 and 1:2 in Ringer's solution 62.1 and 52.9% respectively, and with undiluted semen stored 24–48 hours, 50% fertility (or fertile eggs). [It is not stated whether "per cent success" refers to fertile hens or fertile eggs, but from the figures given, e.g., 52.9% success with 12 hens, it is presumably meant that 52.9% of eggs from the group were fertile.]—T. H. FRENCH.

SØRENSEN, E. (1942.) Metoder til Undersøgelse af Spermas Fertilitet. [**Methods of testing**

fertility of spermatozoa.]—Maanedsskr. Dyr-læger. 53. 593-627. 1346

The significance of volume, colour and odour of ejaculates is discussed. Minor alterations in pH yield little information on semen fertility. Spermatozoa counts may be made in a haemocytometer to an accuracy of $\pm 10\%$. Less accurate methods of estimating concentration are described and criticized. Motility is judged best on diluted semen. Spermatozoa may be divided into groups showing progressive, oscillatory, or no movement, and S. describes a differential count based on this classification. The relationship described by Blom between patterns of wave motion in semen and activity of spermatozoa is described. S. discusses the Walton-Edwards exhaustion test as a measure of the animal's potential reserve of spermatozoa, and the estimation of ascorbic acid and counts of immature and abnormal spermatozoa as criteria of fertility.

The anaerobic breakdown of glucose to lactic acid effected by spermatozoa involves a series of oxidation-reduction systems with H-donors and H-acceptors. The dehydrogenation test for estimating the intensity of spermatozoa metabolism is based on the use of methylene-blue as a H-acceptor and the measurement of its rate of conversion to leucomethylene-blue under standard conditions.

The test, which is described in detail, indicates the degree of activity of spermatozoa and seems relatively easy to perform.—E. F. McC.

LESBOUYRIES, G. (1944.) *Appréciation de la fécondité du mâle par l'examen du sperme. [Estimation of male fertility by examination of semen.]—Rec. Méd. vét. 120. 113-122. 1347*

This is a review of the literature concerning most species of domestic animals and incorporates little or no original research. Various methods of semen collection in all species and several sperm-staining techniques are described. The dilution of semen with 2% potassium hydroxide and its treatment with methylene-blue solution is recommended as a preliminary to sperm counts. Various conflicting views as to the connexion between motility and fertility all receive mention, but no final opinion is expressed. [No mention is made of the "wave-motion" phenomenon.] Morphological abnormalities are described in some detail: authorities agree that fertility is impaired when the proportion exceeds 20%, but L. considers that a stained film rich in abnormal sperm is apt to give an incorrect picture, owing to the artefacts during the preparation, as well as to changes undergone in the lower parts of the genital tract. Due stress is given to the importance of metabolic tests in assessing the quality of semen.

The conclusion is a warning that no single criterion is of any use in assessing the fertilizing capacity of a sample of semen, only a series of "parallel observations" having value.

—F. L. M. DAWSON.

VANDEMARK, N. L., MERCIER, E., & SALISBURY, G. W. (1945.) *The methylene-blue reduction test and its relation to other measures of quality in bull semen.—J. Dairy Sci. 28. 121-128. 1348*

Samples of fresh ejaculates from 39 bulls were subjected to detailed analysis including the determination of ascorbic acid. They were then diluted with yolk citrate, tested with methylene-blue and incubated for an hour at 46.5°C. Some of these diluted samples were cooled to 5°C. and maintained at this temperature for ten days. Tests were made for glucose and lactic acid at the beginning and end of incubation and before and after storage. Viability was expressed as the percentage of spermatozoa still motile after incubation and/or cold storage. Results, which are expressed as correlation coefficients, give good correlation between methylene-blue reduction time, initial motility, pH and lactic acid content, also between the reduction time and motility after high temperature incubation and prolonged cold storage, and eventually with lactic acid gain also, but not directly with glucose loss. It was shown that samples of high sperm density had a low survival power, as they ran out of glucose before the end of the storage period. Results suggested that morphologically abnormal sperms have normal metabolic rates: the reduction test is of no use with such sperms. Nevertheless, it is claimed the test is valuable, being easily performed and well correlated with viability.—F. L. M. DAWSON.

MERCIER, E. (1946.) *Seasonal effect on spermatogenic activity in the bull and reproduction in cattle.—J. Dairy Sci. 29. 556. [Only abst. given: slightly amended.] 1349*

A yearly study of the semen characteristics of 10 bulls (5 Holstein and 5 Guernsey) used for artificial insemination in New York State revealed a highly significant breed difference only in respect to fertility.

Highly significant individual differences occurred for frequency of collection, volume, concentration, total sperm per ejaculate, methylene blue reduction time, tailless heads, abnormals and fertility. The differences among bulls in the percentage of motile sperm was significant at the 5 per cent level of probability.

Highly significant monthly differences occurred for all the above-mentioned characteristics, except volume which varied at the 5 per cent.

level of probability and total number of spermatozoa which did not vary significantly.

A comparison between consecutive first and second ejaculates collected at a brief interval of time revealed a highly significant difference in respect to volume, percentage of motile sperm, concentration, total spermatozoa and tailless heads. The difference between ejaculates in the proportion of abnormal spermatozoa did not vary significantly.

A highly significant positive correlation occurred between the concentration and the fertility of 318 ungrouped ejaculations of these 10 bulls. In the same ejaculates, methylene blue reduction time and morphologically abnormal spermatozoa were negatively correlated with fertility at the 5 per cent level of probability.

The determination of the relationship between the characteristics of semen collected from 1942 through 1944 and the climatic factors for the corresponding period (temperature, barometric pressure, relative humidity, and length of day) showed that temperature and length of daylight are both negatively correlated with spermatogenic activity in the bull and reproduction in cattle under New York conditions. However, outside temperature and length of day are positively correlated with fertility of cattle under natural breeding in Eastern Canada.

DUNĂREANU, N. (1943.) Ricerche sulla raccolta e qualità dello sperma di gallo, ottenuto mediante il metodo del massaggio addominale. [**The fertility and quality of cock sperm.**].—*Anal. Zootech. Inst. Român.* 9. 148-191. [In Italian.] 1350

This is a description of the technique of collecting semen by massage of the abdomen and of the microscopical appearance of the spermatozoa. Leghorn, Rhode Island Red, Wyandotte and Plymouth Rock cocks of various ages were used in this study.—R. MACGREGOR.

AUSTIN, C. R. (1941.) **The reproductive hormones: a review of chemical and physiological aspects.**—*Aust. vet. J.* 17. 222-228. 1351

The subject matter of this review includes discussion of (1) the endocrines of the pituitary gland and the gonads; endocrine interrelationships, with reference to androgens and oestrogens, pituitary and sex hormones, and adrenal gland and sex hormones, (2) synthetic compounds having the properties of sex hormones, (3) the relationship between sex hormones and other sterol derivatives. Cholesterol, vitamins D, D₂ and D₃ and a number of heart poisons (of digitalis-like character) are mentioned. The carcinogenic activity of con-

siderable doses of the oestrogens and the oestrogenic activity of some of the carcinogenic compounds in small doses are discussed, (4) the standardization of gonadotropic hormones, oestrogens, progesterone and androgens.—D. A. T.

SIÉGEL, J. (1946.) Inaptitude au coït par suite du dysfonctionnement des muscles rétracteurs du pénis chez le taureau. [**Impotence in bulls due to spasm of the retractor penis muscles.**].—*Rec. Méd. vét.* 122. 64-70. 1352

Bulls are occasionally impotent owing to abnormally short retractor-penis muscles which prevent the sigmoid flexure being straightened during erection. In some animals, the muscles, though of normal length, are stimulated too early and withdraw the penis before ejaculation is complete. Both conditions can be diagnosed by palpation during service. Removal of 6-8 cm. of the muscles frequently remedies the trouble and does not result in a permanently protruding penis.

The operation may be performed under posterior epidural anaesthesia at a point about a hand's breadth below the ischial arch, but, if the animal's thighs are set wide apart, it is preferable to operate between them immediately behind the scrotum using a local anaesthetic. The animal should be put to service some three days later and should serve every day until recovery is complete to prevent the severed muscles re-uniting and contracting.—R. MACGREGOR.

ARROYO B, V. M. (1943.) Un caso de "transfiguración sexual femenino masculiniforme" en una ternera. (Seudo-hermafroditismo femenino). (Ginandroides). [**Sexual transformation (female hermaphroditism) in a calf.**].—*An. Fac. Med. vet., Univ. La Plata.* 6. 17-37. 1353

A pseudo-hermaphrodite calf, 14 months old, is described. The configuration was feminine but there was no vulva and the animal micturated through an orifice just behind the udder. P.M. examination revealed infantile ovaries, uterus and vagina, while the lips of the vulva joined and surrounded a penis-like organ in the manner of the corpus cavernosum. This penis-like organ extended to the orifice but had no "S" flexure. In sections of an ovary no germinal epithelium could be seen, this being entirely replaced by connective tissue. There was a neoplastic growth attached to the pineal body.—R. MACGREGOR.

BENNETTS, H. W., UNDERWOOD, E. J., & SHIER, F. L. (1946.) **A specific breeding problem of sheep on subterranean clover pastures in Western Australia.**—*Aust. vet. J.* 22. 2-12. 1354

This condition has assumed considerable

importance during the past five years in areas where the early strain (dwalganup) of subterranean clover is prevalent. Unbred and virgin ewes produce milk and have marked mammary development. Breeding ewes may be infertile or be affected with uterine inertia and resulting dystocia and death of full-time foetus, or may have uterine prolapse, usually some months after lambing. Wethers may lactate and develop an accessory sex organ lined by vaginal epithelium.

The disease appears after the ingestion of the specific strain of clover and may be due to an oestrogenic substance occurring in the plant.

—D. C. BLOOD.

WEBER, W. (1944.) Monofollikuläre, zweieiige Zwillinge bei der Ziege. [**Monofollicular, double ovum twins in the goat.**]—*Schweiz. Arch. Tierheilk.* 86. 489-498. 1355

Opportunity was presented for the dissection of a goat pregnant with twins. The atlanto-chorion of both kids was continuous and blood anastomosis between them was in evidence. Two amniotic sacs were present. Only one corpus luteum was found and the twins were of different sexes, thus establishing the monofollicular, double ovum state. The ovary of the female twin had slight evidence of intersexuality. The whole question of twinning and intersexuality in goats is discussed.—C. W. OTTAWAY.

WEBER, W. (1943.) Verkürzung des Achsenskelettes bei der Ziege. [**Shortening of the spine in the goat.**]—*Schweiz. Arch. Tierheilk.* 85. 472-477. 1356

This is an account of a congenital abnormality in a goat. At birth, following normal gestation and delivery, the kid, which lived only a few minutes, was very short in the back, with the hind quarters twisted to the right-hand side by obvious fusion of some skeletal structures. Dissection of soft structures revealed nothing abnormal apart from herniation of part of the rumen into the chest and, as a result of the twist of the spine, misplacement of the ureters and bladder, causing retention of foetal urine.

The skeleton of the head and limbs, including the pelvis, was normal, but the vertebral column consisted of seven cervical vertebrae (the axis shortened and nos. 3-6 fused at their centre), 9 cm. long and a thoraco-lumbo-sacral mass 6½ cm. long. The angle of twist occurred at the dorso-lumbar junction. Only 3 pairs of ribs were present, attached to an oval-shaped sternum developing from 4 sternebral centres. No coccygeal vertebrae were present.

The possible association between this case

and a recessive factor causing shortening of the spine in cattle are discussed.—C. W. OTTAWAY.

BERNOULLI, P. (1943.) Das Verhalten der Hoden in cinigen Missbildungen des Geschlechtsapparates beim Hunde. [**Retention of the testicles in certain deformities of the sexual organs in the dog.**]—*Schweiz. Arch. Tierheilk.* 85. 444-453. 1357

Examination of the genital organs in a case of retention of the right testicle in a dog, led B. to discuss the possible association between such cases and intersexuality. In the case under review the structures of the left side were normal both to macro- and microscopic observation, but on the right-hand side, the testicle, which was retained in the pelvic cavity, was very small, the vas deferens long and tortuous and the epididymis enlarged. Section of the right testis gave no evidence of spermatogenesis but masses of tissue were found which could be described as sexually indifferentiated. Current literature on this subject is reviewed in light of the evidence presented.

—C. W. OTTAWAY.

ANON. (1945.) The occurrence of congenital defects in children following maternal rubella during pregnancy.—*Med. J. Aust.* July 28th. 122-126. 1358

One hundred and eighty cases of children suffering from congenital defects are recorded during the period 1923-42. In 180 of these cases there was maternal exanthema during pregnancy; in 18 this was denied. Thirty-two of the cases in children were unaccompanied by maternal histories, but appeared to belong clinically within the group in which maternal rubella infection was associated with congenital defects. Six other cases are recorded of maternal exanthema during pregnancy, from which normal children were born.

In 1940, 116 cases of congenital defects occurred. In this year, rubella was epidemic in New South Wales, the majority of cases occurring from June to October.

The incidence of the congenital defects in the 180 fully reported cases (covering the 1923-42 period) was as follows:—deaf mutism, 85; deaf mutism and heart disease, 17; heart disease, 5; eye disease, 6; eye and heart disease, 8; deaf mutism, eye and heart disease, 8; deaf mutism and eye disease, 1.

If the infection is after the second month of pregnancy there is less likelihood of eye disease occurring in the child. Apparently maternal rubella does not result in congenital defects in the child if it occurs later than the fourth month of pregnancy.—D. A. TITCHEN.

DISEASES, GENERAL

WAGER, V. A. (1945.) **Compost and disease.**—*Proc. Congr. S. Afr. Sug. (Tech.) Ass.*, 1945. pp. 85–90. 1359

The claims made by Howard that foodstuffs grown on soil which has been manured with compost will prevent disease in man and animals are discussed. It is pointed out that while some diseases attack particularly undernourished subjects, there are others which do not discriminate. Cattle suffer severely when affected with nagana (trypanosomiasis) while wild game have little or no ill effects: yet both graze on the same veldt.

The influence of compost on susceptibility to disease was tested experimentally using tomato plants and two of their diseases (bacterial wilt and eelworm). In both experiments the tomato plants manured with compost were no more resistant to infection than unmanured plants or those manured with artificial fertilizers. W. concludes that while certain diseases may be cured or prevented by any means, including manuring with compost, which promote the health and vigour of the plants, there are others which cannot.—M. C.

BERRY, L. J., DAVIS, J., & SPIES, T. D. (1945.) **Phagocytic activity of neutrophils in anemias.**—*J. Lab. clin. Med.* 30. 910–916. 1360

The authors measured the phagocytic activity of the neutrophils in 29 cases of anaemia in man. They claim that the activity in these cases increased in a manner roughly proportional to the degree of anaemia. They have suggested that this phenomenon may be responsible for the somewhat surprising resistance to infection encountered in some cases.—A. R. JENNINGS.

DUGUID, J. P. (1946.) **The size and the duration of air-carriage of respiratory droplets and droplet-nuclei.**—*J. Hyg., Camb.* 44. 471–479. [Author's summary copied *verbatim*.] 1361

The sizes of the droplets and droplet-nuclei produced by sneezing, by coughing and by speaking, were studied by the microscopic measurement of 12,000 droplet stain-marks found on slides exposed directly to mouth-spray, and of 21,000 stain-containing droplet-nuclei recovered from the air on to oiled slides exposed in the slit sampler.

From these measurements it was calculated that the original diameters of the respiratory droplets ranged from 1 to 2000 μ , that 95% were between 2 and 100 μ and that the most common were between 4 and 8 μ . Similar size distributions were exhibited by the droplets produced in sneezing, in coughing and in speaking, except that, in the case of sneezing, the smaller droplets were relatively more numerous.

The respiratory droplet-nuclei were found to range in diameter from $\frac{1}{4}$ to 42 μ ; 97% had diameters between $\frac{1}{2}$ and 12 μ ; the commonest diameter was between 1 and 2 μ .

The proportion of droplets of each size which will contain bacteria, whether commensal or pathogenic, is determined by the size of the droplets and by the numbers of bacteria in the secretions atomized. Calculations made on the basis of the size distributions obtained in this investigation indicated that few of the smaller droplets, and thus few of the droplet-nuclei, are likely to contain pathogenic organisms. Droplet-spray is unlikely to give rise directly to true airborne infection unless very large numbers of pathogenic organisms are present in the secretions of the anterior mouth.

The persistence of droplet-nuclei in the air of a 1,700 cu. ft. room and of a 70 cu. ft. chamber was investigated by sampling the air with the slit sampler at intervals following sneezing.

When the air was not artificially disturbed by a fan, the time taken for the disappearance from the air of 90% of the bacteria-carrying droplet-nuclei varied from 30 to 60 min.; the nuclei larger than 8 μ in diameter usually disappeared within 20 min., and the nuclei larger than 4 μ within 90 min.; the smaller nuclei, few of which contained bacteria, remained airborne for much longer periods, on one occasion for at least 30 hr. When a fan was run throughout the experiment, the nuclei disappeared from the air much more rapidly.

WINSSER, J. (1946.) **Acropachie bij mensch en dier. [Clubbed finger in man and animal.]**—*Tijdschr. Diergeneesk.* 71. 167–184. [English and French summaries.] 1362

W. reviews 100 publications dealing with clubbed finger in man and several species of animals (dog, cat, lion, horse, rabbit, hare, fowl, ox, deer and roebuck). The disease is rare in cattle and has never been recorded in sheep, pigs or goats: the cause has not been determined. It is significant to note that although tubercular lesions in the lungs of man and some of the animals are regarded as a possible causal factor, the disease is practically unknown in cattle, a species in which TB. is common. Some of the cases recorded are not regarded true cases of the disease.—P. L. LE ROUX.

PETIT, M. (1941.) **Néoforations osseuses chez le mulet. [Ostoses in the mule.]**—*Rev. Méd. vét., Lyon et Toulouse.* 92. 113–117. 1363

P. described two types of osseous deformities met with in Army mules. The first condition was

seen in the lower maxillary region and was a pedunculated outgrowth with a flat button top. The second condition was seen mainly in the fore-limb in the sesamoidean region. Osteophytes from the sesamoidean bones invaded the back tendons and the suspensory ligament. Strain, overwork, and trauma were said to be the primary causes.—A. R. JENNINGS.

SEAGREAVES, C. H. (1945.) **A new surgical technique for "frothy bloat".**—*J. Amer. vet. med. Ass.* 107. 73-74. 1364

S. recommends rumenotomy as a routine treatment of severe cases of "frothy bloat" and describes a technique that can be completed within an hour of arrival on the farm. The operation is performed in the cast position with local anaesthesia. The rumen is opened with a 6 in. incision and attached to the skin with 4 pairs of tumour forceps. After turning the animal on to its back the "bloat" is expressed by kneeling on the abdomen, after which the animal is allowed to rise before suture is commenced.—R. A. ROPER.

ANDRES, J. (1943.) *Die Feuer-Therapie der chronischen Gonitis des Rindes. [Pyrotherapy of chronic gonitis in cattle.]—Festschrift Oskar Bürgi, 1943.* pp. 35-51. Horgen-Zürich: Fritz Frei. [In German.] 1365

Two methods of firing in the treatment of chronic gonitis in cattle are described and illustrated. In the first method, the subcutaneous tissue and underlying fascia on the lateral aspect of the affected joint are treated with a thermocautery (Déchery) through a vertical incision made in the skin under local anaesthesia. The skin incision is then closed with a single suture: this reduces the size of the subsequent cicatrix. In the second method, a special electrocautery is used to make a number of deep punctures over the lateral and anterior aspects of the affected joint, some of which penetrate the joint capsule. A high proportion of cures in cases so treated is recorded.—E. COTCHIN.

RENK, W. (1944.) *Kongenitale Verkalkung der Lunge bei einem Kalbe. [Congenital lung calcification in a calf.]—Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 52/50. 324-326. 1366

Examination of the lungs of a 14-day-old normally developed calf revealed numerous enlarged greyish-white lobules, which on sectioning were found to have inflammatory changes and wide alveolar septa containing deposits of calcium. In some, evidence of early bone formation was seen. The aetiology is reviewed and its association with blood formation is discussed.—C. W. O.

ROBERT & MERIGUET. (1942.) *Invagination, chez un bovin, de la caillette dans le feuillet.*

[Invagination of the abomasum into the omasum in a bovine.]—Rec. Méd. vét. 118. 203. 1367

A casualty bullock was brought to the abattoir accompanied by a veterinary certificate in which the condition was described as chronic flatulence. On examination P.M. the abomasum was found to be almost completely invaginated into the omasum, only the terminal part of the abomasum being visible. When repeated traction was applied, the invagination was reduced.

The bullock had been seen by a veterinary surgeon three weeks previous to slaughter, when it had cessation or diminution of rumination, inappetence and constipation. Later, when tympany occurred, immediate slaughter was decided upon.

The authors believe the condition may have been due to drinking very cold water. They consider the prognosis grave. They discuss the possibility of an operation, but point out that in this case the condition of the abomasum was hardly favourable. Slaughter is possibly the most economic solution if such cases are met with in practice.—J. S. S. INGLIS.

DICK, G. F., & SCHWARTZ, W. B. (1946.) **Experimental endocarditis of dogs.**—*Arch. Path.* 42. 159-162. [Authors' conclusions copied verbatim.] 1368

Contrary to existing opinion, bacterial endocarditis may be produced in dogs without previous injury of the cardiac valves.

It is not necessary to use streptococci from sites of endocarditis, as streptococci from a great variety of sources produce the disease in dogs.

While virulent strains produce endocarditis in shorter time and with fewer injections than do the less virulent strains, it is necessary only to continue the injections of the less virulent ones for a longer time and in increased doses to produce endocarditis regularly.

BONADUCE, A. (1942.) *Sulla pleurite infettiva del gatto. [An outbreak of contagious pleurisy in cats.]—Nuova Vet.* 21. 32-36. 1369

An outbreak of pleurisy, apparently contagious, occurred among cats in Naples between March, 1940, and January, 1941. Some 20 cases were observed, the animals affected being of all ages, and all emaciated, apparently the effect of the disease rather than of malnutrition. The pleurisy was usually unilateral and fibrinous, but occasionally purulent. It was slow in developing and invariably fatal. The symptoms suggested TB. or glanders, but laboratory examination failed to demonstrate any organism and the exudate was not pathogenic to g. pigs, rabbits or mice.

—R. MACGREGOR.

TERPSTRA, J. I. (1941.) Een onderzoek naar het voorkomen van nier-afwijkingen bij meer of minder zieke dieren. [**Examination of the kidneys of sick animals.**].—*Tijdschr. Diergeneesk.* 68. 895-897. [English, French and German summaries.] 1370
T. describes the macroscopic appearance and

histo-pathological changes of kidneys, (i) in two cattle which had recently had an acute disease, (ii) in four cattle and one horse, that had had a clinically acute disease some time previously and (iii) in nine cattle with marked emaciation due to such disorders as TB., chronic enteritis, fascioliasis, teleangiectasis, etc.—P. L. LE ROUX.

NUTRITIONAL AND METABOLIC DISORDERS

HANDLER, P. (1946.) **Factors affecting the occurrence of hemorrhagic kidneys due to choline deficiency.**—*J. Nutrit.* 31. 621-633. 1371

Renal lesions in the rat due to choline deficiency occur or can be induced at any age, but the greatest incidence was observed in young rats on a suitable experimental diet when the food consumption, growth rate and lipid turnover in the kidneys were maximal. Rats housed in groups developed markedly less lesions than those housed in separate cages. The difference may be due to the practice of coprophagy. The addition of 0.5% nicotinamide to the diet to increase the demand for methionine resulted in renal lesions even in the rats housed in groups.

The effect of various lipotropic factors was also studied. Inositol, while exerting lipotropic activity in the liver, slightly increased the incidence of the renal lesions. Inositol fed together with α -tocopherol and lipocaic, a preparation from frozen beef pancreas significantly decreased the number of lesions. Inositol alone, biotin or folic acid were without effect. When the casein in the diet was decreased to 6% the lesions in the kidneys of weaned rats developed only after five weeks, while high protein diets resulted in lesions within ten days. Few adult rats fed a choline-deficient diet developed haemorrhagic renal lesions. When, however, they were subjected to a unilateral nephrectomy, lesions appeared after 10-14 days, at a time when the remaining kidney hypertrophied.—E. KODICEK.

GLYNN, L. E., & HIMSWORTH, H. P. (1944.) **Massive acute necrosis of the liver: its significance and experimental production.**—*J. Path. Bact.* 56. 297-305. 1372

The authors describe massive acute necrosis in rats caused by feeding a diet deficient in protein. The lesion could be prevented by the addition to the diet of methionine or a sufficient quantity of casein, but not by the addition of yeast protein. Comparisons are drawn with similar lesions of liver necrosis as they occur in the human being, e.g., with acute yellow atrophy, the effects of such liver poisons as trinitrotoluene, chloroform, etc. Summarizing these results, the authors conclude

that the necrosis is essentially massive, involving the whole of many adjacent lobules. However, lobules may be found, with a roughly zonal arrangement of the necrosis unlike the orderly zonal necrosis of chloroform or carbon tetrachloride poisoning.

As the proportion of casein in the diet approaches that which gives complete protection, an increasing number of livers have a partial necrosis in special sites of predilection. This fact suggested a common blood supply to these parts as a factor in their causation: this was confirmed by injecting Indian ink into the spleen of anaesthetized rats; the parts which became blackened were the sites of partial necrosis. Pressure of contiguous parts is also believed to be an accessory factor. Since the products of protein digestion are carried first to the right lobes, these survive to the detriment of the rest of the organ when the diet is protein-deficient. Methionine (20 mg. per day) is protective for the rat.

In necrosis produced by liver poisons every lobule is affected and it is zonal in distribution, whereas in that caused by protein deficiency the areas of necrosis alternate with areas of healthy tissue. The sequelae differ also, inasmuch as that chemical poisoning results in the finely granular undistorted multilobular type of cirrhosis, whereas the dietetic variety produces an irregularly scarred nodular liver.—A. H. HOGG.

HIMSWORTH, H. P., GLYNN, L. E., BEATTIE, J., & WILSON, C. (1945.) **Discussion on the influence of nutritional factors in liver disease.**—*Proc. R. Soc. Med.* 38. 101-108. 1373

HIMSWORTH described experimental work on the production of massive hepatic necrosis in rats by diets deficient in protein [see also abst. preceding]. The liver changes occurring when necrosis affects only part of the liver are most marked in the left lobes since the blood from the superior mesenteric vein, carrying the products of protein digestion, passes mainly to the right lobes. Rats on diets deficient in lipotropic factors or rich in fat, develop heavy fatty infiltration which may eventually progress to portal cirrhosis. There is evidence that massive hepatic necrosis

in the native population of certain parts of the tropics may also be related to deficiency of dietary protein. In temperate climates there is no evidence of protein deficiency as a cause in man and it is probable that massive necrosis in such cases is a more complex condition. Its occurrence in T.N.T. poisoning may be due to the combination of T.N.T. with amino-acids, which are thus rendered inutilizable. Most cases, however, are secondary to infective hepatitis, yellow fever vaccine jaundice, chloroform poisoning or other conditions in which liver damage occurs. Even in these conditions, it is possible that inadequacy of the protein supply to the liver, brought about either directly or indirectly, may be an important factor. Alcoholism is at most a contributory factor in causing portal cirrhosis in man and the essential change is prolonged fatty infiltration of the liver, which in turn may be due to defective diet.

GLYNN described in some detail the differences between the liver lesions produced in rats in the two conditions of acute massive necrosis and diffuse cirrhosis following fatty infiltration. The cirrhosis which follows the first type of lesion is characterized by the irregularity of its distribution, the presence of areas of recent necrosis and evidence of areas of regeneration in less damaged parts of the liver.

BEATTIE considered that dietary deficiency of protein in man was important in increasing susceptibility to the epidemic forms of hepatitis. Furthermore, in established cases of hepatitis methionine administration caused rapid improvement in severe cases. Adequate intake of methionine was important during convalescence.

WILSON stated that there was no convincing evidence that dietary deficiency was a factor in determining the course of infective hepatitis in this country. Observations on 100 cases, alternate ones receiving 5 g. of methionine daily, had shown no statistical difference between the treated and the control group.

In his reply, HIMSWORTH stressed that there was no proof that methionine deficiency caused massive necrosis of the liver directly nor was there any indication that hepatitis due to poisons or viruses could be influenced by diet. It was probable, however, that a high protein diet, or methionine, might prevent the subsequent development of massive liver necrosis.—E. G. W.

SYDENSTRICKER, V. P., HALL, W. K., HOCK, C. W., & PUND, E. R. (1946.) **Amino acid and protein deficiencies as causes of corneal vascularization: a preliminary report.**—*Science*. 103. 194-196. 1374

Rats are particularly susceptible to vascularization of the cornea when placed on diets deficient

in lysine, tryptophane or methionine. Of over 200 inhabitants of Leyden of whom 10% had famine oedema, none showed signs of vascularization. It is therefore doubtful how far findings on this condition in rats can be applied to other animals.—E. BOYLAND.

SHECKER, H. (1943.) **Mineralmangelkrankheit bei Pferden. [Mineral deficiency in horses.]—Bert. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.** November 12th. 397-398. 1375

This is a discursive article with no new information.—R. MARSHALL.

COMAR, C. L., DAVIS, G. K., TAYLOR, R. F., HUFFMAN, C. F., & ELY, R. E. (1946.) **Cobalt metabolism studies. II. Partition of radioactive cobalt by a rumen fistula cow.**—*J. Nutrit.* 32. 61-68. [For part I, see *V. B.* 17. 90.] 1376

Observations were made on the fate of labelled cobalt administered intravenously and directly into the rumen to a cow with a rumen fistula, and confirmatory data were obtained from five cobalt-deficient range cattle slaughtered at various intervals after administration of Co.

After intravenous injection of 174 μ g. Co there was very rapid disappearance of Co from the blood, only about 6% being present 5 min. after injection and less than 1% 10-15 days after. None of the injected Co was found in the rumen contents, about 7% appeared in the faeces, but large amounts were rapidly eliminated in the urine, about 65% of the dose being excreted in this way after 32 hours; very small amounts were found in the milk and saliva.

After introduction of 174 μ g. labelled Co directly into the rumen, none was detected in the blood, but about 82% of the dose was found in the rumen contents after three and three-quarter hours and after 168 hours less than 0.5% of the original dose was present. Large amounts appeared in the faeces within 48 hours and about 65% of the dose was eliminated in this way. Extremely small amounts were detected in the urine and none was detected in the milk or saliva.

—R. ALLCROFT.

GOMORI, G., & GULYAS, E. (1944.) **Effect of parenterally administered citrate on the renal excretion of calcium.**—*Proc. Soc. exp. Biol., N.Y.* 56. 226-228. 1377

In the first experiment seven adult dogs were used which had undergone cannula-cystostomies about a week before. They were given 200 ml. of water by stomach tube on the morning of the experiment and 100 ml. of a 4% solution of sodium citrate were injected subcutaneously 1½ hours later. Urine specimens were collected at half-hourly intervals, and three blood samples

taken. A considerable and prompt increase in the urinary excretion of calcium took place, reaching a high level 60 min. after the injection and returning to normal after five hours. The excretion of phosphate followed no typical course, except for a late increase in excretion. The blood levels of both calcium and phosphorus remained unchanged.

In a second experiment two puppies were kept in individual metabolism cages on a standard diet. Subcutaneous injection of 30 ml. per kg. of 4% sodium citrate considerably increased the excretion of calcium in urine.

In a third experiment repeated subcutaneous injections of citrate into puppies led to the following osseous changes: hyperaemia and oedema of the bone marrow, transformation of osteoblasts into spindle cells, a big increase in the number of osteoclasts, fragmentation of bone trabeculae and production of areas of early fibrosis, *i.e.*, the picture was very similar to that produced by toxic doses of parathormone.

In a fourth experiment young rats, when given citrate subcutaneously for five days, developed lesions identical with those seen in the puppies, although the changes were much less pronounced.

—R. MORGANSTERN.

SCOTT, H. M., JUNGHER, E., & MATTERSON, L. D. (1944.) **Possible role of potassium in pullet disease.**—*Proc. Soc. exp. Biol., N.Y.* 57. 7-10. 1378

Visceral gout [uric nephrosis] is one of the characteristic lesions associated with pullet disease. Various substances are known to be toxic to chicks, producing kidney lesions indistinguishable from those of pullet disease. Certain other substances may be protective against the toxic material when both are added to the same diet.

In the experiments described, day-old or one-week-old chicks were fed for 14 days on a routine diet with the addition of various supplements of both toxic and protective substances. In the toxicity experiments, sodium citrate at a level of 4% gave the most consistent results, causing an average mortality of 70.4% at about the eighth day, with lesions indistinguishable from those of visceral gout. In all protection experiments, 4% sodium citrate was used as the toxic principle. Various potassium salts gave some degree of protection and since potassium seemed to be the protective principle, potassium chloride was tested on a larger scale. Six graded levels of 0.015-0.5% gave no protection, but 1% and 2% reduced the mortality to 11.4% and 16.4% respectively. In a subsequent experiment, muriate of potash as used in commercial fertilizers was tested at a level of 1.57% and found to be protective. Molasses also gave some protection.

In addition to the experiments with chicks, 30 hens with acute pullet disease were obtained from a field outbreak and kept at the laboratory for six weeks. They were divided into two lots, one group receiving 2% KCl in their mash. There was no significant difference in the mortality of the two groups, but those receiving the KCl supplement appeared to regain egg production faster and to combat kidney damage better than those in the control group.—J. D. BLAXLAND.

NORDFELDT, S. (1946.) Mikroelementens betydelse för husdjuren. [The importance of trace elements in the diet of domestic animals.]—*Särtr. Förhandsmedd. LantbrHögsk. HusdjFörsöks.* No. 52. pp. 16. 1379

In Sweden there is a deficiency of copper in the interior of middle and north Norrland, Gotland and Öland and in south-east Götaland. The addition to the fodder of small quantities of copper in the form of a mixture of 0.5 kg. copper sulphate and 100 kg. sodium phosphate administered in doses of 50 g. per animal per day is reported to prevent or cure pinning disease in these areas. Feeding with molasses, which contains a certain amount of copper as an impurity, is also believed to prevent pinning.

In many countries, including Sweden, Denmark and Norway, a deficiency disease with symptoms of pinning and pica in sheep, calves and young animals is frequently prevented and cured by the addition of cobalt to the food.

The addition of cobalt to the food in quantities of 0.5 mg. per animal per day has frequently resulted in rapid improvement. As deficiencies of copper, cobalt and phosphorus in the food frequently cause similar symptoms, mineral supplements should contain 0.5 kg. copper sulphate and 0.05 kg. cobalt sulphate per 100 kg.

Deficiency of manganese has been shown to be one of the causes of slipped tendon in poultry. According to unconfirmed reports, deficiency of manganese in the fodder causes lameness in pigs and reduced fertility in sows. Abnormally high content of manganese in the fodder have in certain cases been assumed to be connected with the occurrence of milk fever in dairy cows and infectious anaemia in horses. In Sweden it has been found that hay from fields especially rich in manganese is poor in Vitamin B₁. Horses which are fed with vitamin B₁-deficient fodder are said to be more susceptible to infectious anaemia than when normal hay is used. According to unconfirmed reports, zinc has a favourable effect on fertility of cows.

Iodine is essential in the food of domestic animals in very small doses as it is included in the hormone thyroxine. The addition of iodine is effective in the prevention of goitre in regions

where this disease occurs. In such areas iodized salt should be used (ordinary cooking salt to which 20 g. [0.02%] potassium iodide per 100 kg. has been added). Molybdenum has not been found to cause any deficiency diseases in domestic animals. An abnormally high content of molybdenum in pasture grass has been assumed to give rise to severe diarrhoea and even to haemoglobinuria in cattle. These reports require further confirmation.—R. PETER JONES.

LECOQ, R. (1945.) Action des injections intra-veineuses de vitamines sur la réserve alcaline. [Action of vitamins on the alkali reserve.]—*C. R. Soc. Biol. Paris.* **139.** 582–583. **1380**

In continuation of earlier studies on the alkaline reserve by the chronaximetric method of CHAUCHARD (1941) the effect of various vitamins on rabbits was examined. All vitamins were given intravenously into the marginal vein of the ear in fasting animals. Ascorbic acid, calciferol and a mixture of vitamin B₁, riboflavin, nicotinamide and adenine had no effect on the alkaline reserve. If, however, pantothenic acid as the Ca salt was added to the mixture of B vitamins, there was an increase in alkaline reserve which persisted for 72 hours. Ca pantothenate given alone had no effect.—A. M. COPPING.

JONSSON, G., OBEL, A. L., & SJÖBERG, K. (1944.) Skorbut als Sekundärscheinung bei A-Avitaminose. II. [Scurvy as secondary symptom in vitamin A deficiency. II.]—*Z. Vitaminforsch.* **15.** 115–140. [French summary.] Reprinted in *Medd. Veterinarhögsk. Stockh.* **18.** (1944.) [For previous article, see *V. B.* **12.** 549.] **1381**

In rats fed a diet deficient in vitamins A and C, as the deficiency of vitamin A increased, the vitamin C content of the blood serum fell and scurvy symptoms appeared in the teeth.

The authors found that when vitamin A was added to diet similarly deficient, vitamin C was synthesized and the vitamin C content of the blood serum rose and the scurvy symptoms disappeared. Oral administration of 2 mg. of vitamin C daily to rats on similar deficient diet did not prevent but retarded the appearance of scurvy symptoms in the teeth and the vitamin C content of the blood serum fell to a very low value. In vitamin A deficiency the changes in the teeth resembled those found in rickets, even when the rats received comparatively large amounts of vitamin D.

These changes appeared at the same time and in an equally marked degree whether the rats received vitamin C or not. White rats which from the age of three weeks were fed a synthetic diet, adequate in the necessary constituents, retained the capacity to synthesize vitamin C even when 7–8 months old.—R. PETER JONES.

I. SEIFRIED, O., & KÖCHER, E. (1942.) Die Veränderungen der Geschlechtsorgane bei Avitaminotischen Hühnern. [Lesions of the genital organs of fowls with vitamin A deficiency.]—*Z. InfektKr. Haustiere.* **59.** 32–41. **1382**

II. WAGENER, K., & HARMS, F. (1943.) Der Einfluss von Vitamin A auf Befruchtung und Schlupffähigkeit der Eier. [The influence of vitamin A on the impregnation and hatchability of the egg.]—*Ibid.*, 303–310. **1383**

I. Histological studies were made of the genital organs of fowls maintained on a diet lacking in vitamin A, and of normal control birds receiving an adequate diet. Of 30 deprived birds in one test, only seven survived for 17 weeks and many of the normal controls in this experiment died from a coccidiosis infection. A second experiment was carried through later and the histological findings were the same in both series of birds.

In the male birds deprived of vitamin A there were marked changes on the testes, including atrophy and degeneration. Less severe degenerative changes occurred also in the spermatic ducts, in the oviducts of the female birds and in the bursa fabricii. The histological appearance of the testes of cocks deprived of vitamin A was very similar to that reported by other observers as due to vitamin E deficiency. The changes due to lack of vitamin A were sufficiently severe to produce sterility in fowls.

II. Studies were made on three groups of White Leghorns with 25 hens and two cocks in each. All groups received a basal diet of very low vitamin A content: one had no supplement, one had green cabbage and one had raw liver. The number of eggs laid and the percentage of infertile eggs, respectively, were 254 and 22.8 for the unsupplemented group, 391 and 8.9 for those having cabbage and 432 and 7.1 for those having liver. The percentages of living chicks hatched in the three groups were 33.9, 48.3 and 54.1. The vitamin A content of the egg-yolks was estimated by the SbCl₃ method and was 2,523, 4,228 and 3,925 I.U. per 100 g., respectively, for the three groups. Very great differences were found also in the vitamin A content of the livers of birds from the three groups.

A similar experiment was made with four groups of ducks penned under various conditions, with and without access to good green pasture. Again, low vitamin A content in the diet was associated with lowering of egg production, fertility and hatchability.

These findings are discussed with reference to the report of SEIFRIED & KÖCHER [see I, above] on the damage to the genital organs of fowls caused by vitamin A deficiency.—A. M. COPPING.

WEINMANN, J. P., & SCHOUR, I. (1945.) **Experimental studies in calcification. I. The effect of a rachitogenic diet on the dental tissues of the white rat. II. The effect of a rachitogenic diet on the alveolar bone of the white rat. III. The effect of parathyroid hormone on the alveolar bone and teeth of the normal and rachitic rat. IV. The effect of irradiated ergosterol and of starvation on the dentin of the rachitic rat. V. The effect of phosphate on the alveolar bone and the dental tissues of the rachitic rat.**—*Amer. J. Path.* **21.** 821–831, 833–855, 857–875, 1047–1055 & 1057–1067. **1384**

I. White rats were given immediately after weaning a rachitogenic diet high in calcium but low in phosphorus and vitamin D. During 56 days these animals were compared with litter mates on a normal diet. There was no hypoplasia nor any defect of formation or calcification of the enamel; dentine formation was retarded and disturbed; cementum formation was normal in rate, but its calcification was defective.

II. A study of alveolar bone in the same group of rachitic rats revealed that formation of new bone proceeds normally, but is uncalcified, persisting as osteoid tissue. Since resorption of osteoid tissue is also checked, there is an excessive accumulation of this tissue; further, there is in consequence a distortion of the growth pattern of alveolar bone and a reduction of the periodontal space in definite areas.

III. Small injections of parathyroid hormone (50 Hanson units) in weanling rats stimulated osteoblastic activity and new formation of alveolar bone, while double this dose resulted in progressive osteoclasts and replacement of the bone by fibrous tissue. It has been suggested that in the first case the formation of an antibody neutralizes the effect of the hormone. The reaction of the bone was essentially the same in normal and rachitic rats. The large doses produced more severe effects in the molar than the incisor region. The hormone causes no resorption of enamel, dentine or cementum.

IV. Fasting and administration of vitamin D were both found to have an identical effect upon the dentine of rachitic rats, causing calcification of the wide rachitic predentine. This result is in agreement with similar results found for epiphyseal cartilage by MCCOLLUM *et al.* (1922) and is explained by the hypothesis that removal of the unbalanced rachitogenic diet causes release of stored phosphorus which corrects the rachitic condition.

V. Intraperitoneal injection of phosphate into rachitic rats caused almost immediate calcification of hyaline tissue, calcification of osteoid tissue at the end of the second day, appearance of

osteoclasts, which resorb calcified hyaline tissue more rapidly than calcified osteoid tissue, and resumption of normal calcification and rate of formation of dentine.—R. MARSHALL.

CARTWRIGHT, G. E., WINTROBE, M. M., & HUMPHREYS, S. (1946.) **Production of anemia in a pig which responded to purified liver extract.** *J. Lab. clin. Med.* **31.** 423–427. [Authors' summary copied *verbatim*.] **1385**

One pig maintained on a diet in which purified casein (Borden's Labco vitamin-free) was substituted for crude casein (Sheffield new process) and to which 2 percent sulfasuxidine was added failed to grow normally and developed partial alopecia and a normocytic anemia. Following treatment with a highly purified antipernicious anemia liver extract, body hair growth was resumed, and following a definite although not marked reticulocytosis the blood returned to normal. The anemia was accompanied by normal erythrocyte protoporphyrin, normal plasma iron, and an elevated serum copper level.

Four animals maintained on a diet in which crude casein was used in place of the purified casein and to which sulfasuxidine was added grew well, maintained normal coats, and failed to develop anemia.

NELSON, M. M., & EVANS, H. M. (1946.) **Pantothenic acid deficiency and reproduction in the rat.**—*J. Nutrit.* **31.** 497–507. **1386**

Reproduction was studied in normal adult female rats placed on purified diets deficient in pantothenic acid before or during the gestation period. When the deficiency of pantothenic acid was developed 16–23 days before mating or instituted on the day of mating it resulted in failure of implantation, in resorption of the foetus, or in defective litters. Partial inanition due to a low food intake was not the cause, as in controls fed pantothenic acid but restricted in the calorie intake to 69% of the normal diet resorption did not occur. When the experimental diet, deficient in pantothenic acid, was fed on the 13th day of gestation, there was no significant difference in the reproductive performance of the deficient and control groups.—E. KODICEK.

BRIGGS, G. M. (1946.) **Nicotinic acid deficiency in turkey poult and the occurrence of perosis.** *J. Nutrit.* **31.** 79–84. **1387**

Turkey poults need nicotinic acid for normal growth and health. When fed highly purified diets, supplemented with all vitamins except nicotinic acid, symptoms of deficiency appeared, consisting of poor growth, low feed consumption, poor efficiency of utilization of the food, poor feathering, inflammation of the mouth, diarrhoea

and perosis. The perosis was not prevented by ample doses of manganese, choline and biotin. The addition of 3-5 mg. of nicotinic acid to 100 g. of the diet prevented the occurrence of the symptoms of deficiency.—E. KODICEK.

BRIGGS, G. M. (1946.) **Observations on an unidentified feather-pigment factor necessary for chickens fed purified diets.**—*Poult. Sci.* 25. 41-46. 1988

Pure-bred New Hampshire or Barred Plymouth Rock-New Hampshire cross-bred chicks, one day old, were fed a purified ration containing glucose, acid-precipitated casein, gelatin, soya bean oil, salts, cystine, vitamin B₁, riboflavin, Ca pantothenate, choline, nicotinic acid, biotin, inositol, *p*-aminobenzoic acid and vitamins A, D₃, E and K. At four weeks, growth and feather development were poor, and there was anaemia and perosis. White areas developed in the feathers in New Hampshire and cross-bred chicks. Mortality was more severe than in White Leghorn chicks, fed a similar ration in an earlier investigation of vitamins B₁₀ and B₁₁, and changes in the colour of the feathers were readily observed. Survivors were given liver fraction L (solubilized liver) or a complete "growing mash". Feathers began to grow again and rapid gains in weight were obtained. When chicks fed the basal ration received the liver supplement throughout the experimental period there was good growth and normal feather pigmentation. The factor or factors responsible for the proper pigmentation have not yet been identified. The feather pigment factor was distinct from all available vitamins, including *p*-aminobenzoic acid and inositol. It may be identical with vitamin B₁₀, B₁₁ or vitamin B_c (folic acid). E. KODICEK.

ANON. (1945.) **Air-borne hormones and vitamins.**—*Med. J. Aust.* July 14th. 53. 1389

The acceptance by botanists of the presence of aerial hormones and the recognition of their activities is noted. Attention is drawn to the hypothesis of CHOLODNY (1944) that there are also aerial vitamins. Comment is made that lack of such vitamins may partly explain the adverse effects of poor ventilation, and that, similarly, their presence may explain the superior health of country children over city children. Attention is drawn to the incompleteness of CHOLODNY's speculation which is apparently presented without experimental study.—D. A. TITCHEN.

RAINEY, J. W. (1945.) **Pregnancy toxæmia in a cow.**—*Aust. vet. J.* 21. 38-40. 1390

An old high-producing Jersey cow had been running for several months on rough uncultivated land subject to flooding by salt water in winter. A succession of dry winds and early frosts resulted

in impoverishment of the marsh pasture. Towards the end of March the cow began to waste rapidly, though still feeding well. On April 3rd it was in a weak, staggering condition, refused to eat, but drank readily. On April 6th, R. examined the cow and found it to be in poor condition, with a weak rapid pulse, temperature of 100°F. and a strong smell of acetone from the breath. A foetus was readily palpated. On April 7th, the animal was destroyed and the liver was found to be the greyish-yellow characteristic of pregnancy toxæmia. A live full-term bull calf was found in a normal uterus.

R. regards this case as evidence of the relationship of the acetonaemia syndrome of the lactating cow with pregnancy toxæmia of the ewe.

—D. A. TITCHEN.

ZWIJNENBERG, H. A. (1942.) **Beschouwingen over de aetiologie, het wezen en de therapie der z.g. kalfziekte. [Observations in the aetiology course and therapy of milk fever.]**—*Tijdschr. Diergeneesk.* 69. 253-265 & 266. [English, French and German summaries: abst. from English summary.] 1391

The symptoms of milk fever are compared with those of shock, especially shock due to haemorrhage, as seen in human beings. In milk fever an abnormal quantity of milk is produced *post partum* and there is stasis of blood in the peripheral veins, following the extensive capillary dilatation in the udder. This is succeeded by heart failure.

Z. examines the theories put forward as to the aetiology of the disease and concludes that the immediate cause lies not in any change of the chemical composition of the blood, but in disturbance of the endocrine system. The favourable effect of insufflation of the udder must be ascribed to the closing by mechanical pressure of the dilated capillary area. The intravenous injection of sodium salicylate with caffeine (15 g. in 20 ml. water) produces excellent therapeutic effects. Cure depends on the adjustment to normal of the body fluids: Z. concludes that this can be brought about only by the subcutaneous, intravenous or intramuscular injection of 500-750 ml. of physiological saline.

OLSON, T. M. (1944.) **Bloat in dairy cattle.**—*Circ. S. Dak. agric. Exp. Sta.* No. 52. pp. 11. 1392

This is a popular review in which various theories concerning the aetiology of bloat are discussed and methods of prevention are recommended. Data are given of the actual pressures recorded in the rumen of bloated cattle. In all cases these are less than pressures that were found necessary to cause rupture of the diaphragm in

dead animals. The insufflation of the rumen of normal animals to pressures ranging from 50–120 mm. Hg is stated to exceed the powers of

endurance of the animal if belching is prevented. No account is given of exactly what happens.

—A. T. PHILLIPSON.

See also *absts.* 1337, 1338 (nutrition and cancer), 1402 (nutrition and pregnancy), 1443 (vitamin K), 1460 (copper deficiency), 1466, 1467 (feeding of laboratory animals).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

WRIGHT, R. D. (1941.) **Recent developments of knowledge of liver function and behaviour.**—*Med. J. Aust.* Dec. 6th. 635–639. 1393

The subject is reviewed, with emphasis on its importance to the clinician. It is claimed that a diet adequate in carbohydrate and protein and low in fat is of value in decreasing the toxicity to the liver of agents such as chloroform, carbon tetrachloride and the arsenicals. It is stated that methionine is the amino acid fraction of protein with the greatest protective action; cystine is rated second, whilst the other amino acids are of no particular value. Tests for liver function are discussed.—D. A. TITCHEN.

MILLER, J. C., & MONGE, L. (1946.) **Body temperature and respiration rate, and their relation to adaptability in sheep.**—*J. Anim. Sci.* 5. 147–153. 1394

In attempts to correlate the adaptability of certain pure and cross breeds of sheep to relatively warm climatic conditions in the south-western part of the U.S.A., periodic observations were made of rectal temperature and respiration rate at different times of the day during the summer period. Parallel records were kept of atmospheric temperature and relative humidity. In general, body temperature and respiration rate of the sheep tested were influenced by atmospheric temperature changes more in pure-bred than in cross-bred animals. Recordings for pure Southdowns and Hampshires were highest at all hours of the day. Cross-bred sheep [Southdown × Rambouillet, Dorset × Rambouillet and Suffolk × Rambouillet] had a lower respiration rate than pure-bred and their body temperatures were more akin to those of fine wool breeds (Merino and Rambouillet); of the pure-bred groups, Merinos showed least daily fluctuations and of the cross-breeds, Suffolk and Rambouillet crosses, the least. Independent observations of breeding, growth and health records of the various breed groups in the Texas State College flock closely paralleled the above findings on the efficiency of heat disposal of the various breeds and crosses and it is suggested that the correlation between thermoregulatory efficiency and flock record is more than a matter of coincidence.—A. EDEN.

McELROY, W. D., WHITELEY, A. H., COOPER, K. W., PEASE, D. C., WARREN, G. H., & HARVEY, E. N. (1944.) **Bubble formation in**

animals. VI. Physiological factors: the rôle of circulation and respiration.—*J. cell. comp. Physiol.* 24. 273–290. [For previous parts, see *V. B.* 16. 161.] 1395

This paper considers the various physiological factors affecting the circulation and respiration in relation to bubble formation in cats at high altitudes, the altitudes (usually 45,000 ft.) being simulated in a low-pressure chamber. Clip electrodes from a 60-cycle, 17-volt A.C. with a stimulus lasting 0.2 sec., applied once a second were attached to the skin of the hip or thigh region, this producing the energy output required while the animals were under test. After stimulation at atmospheric pressure and immediate decompression to 45,000 ft., bubbles appeared regularly in the circulatory system. In contrast, bubbles did not appear in cats not so stimulated before decompression. Anoxia with its attendant hyperventilation greatly delayed bubble formation at altitude. It is concluded that anoxia produces this effect by the vasodilation caused by hyperventilation.

SINGER, K. (1945.) **Problems of erythrocyte disintegration with particular reference to the life span of the red cell.**—*J. Lab. clin. Med.* 30. 784–799. 1396

The average life of the red cell is 100–120 days and under physiological conditions its disappearance depends upon its age. The method of cross determination of the life time of red cells, that is, the survival of red cells in a patient with a haematological disorder and of the red cells of the patient in a normal individual, shows whether the cause of the disorder is due to extra- or intracorpusecular abnormalities.

Haemolytic syndromes can be classified as (1) disorders due to a variety of substances which injure the red cells and (2) diseases in which there are structural defects in the red cells. Factors causing haemolysis seem to be qualitatively different from the causes of physiological disintegration.—A. T. PHILLIPSON.

McCoy, R. H., & SCHULTZE, M. O. (1944.) **Chemical studies related to hematopoietic activity of bone marrow.**—*J. biol. Chem.* 156. 479–489. 1397

An analytical survey of various components of the bone marrow in rats was carried out to study the changes occurring at different stages of

haemopoiesis. In rats on a diet deficient in Cu there was a marked shift in the proportion of water-soluble and water-insoluble marrow constituents, mainly as a result of a decrease in the water-insoluble fraction; the proportion rapidly returned to normal when Cu was given. The amount of Hb in the marrow of normal and Cu-deficient rats and of rats recovering from anaemia was small, varying from 27 to 71 γ Hb per mg. of fat-free solids. The low level present during rapid haemopoiesis following Cu therapy suggests that the rate of synthesis of Hb and its transference into the blood stream is very rapid: the amount of Hb synthesized during a five-day therapy period would require a complete turnover of the soluble N of the marrow every 16 hours and unpublished work on Fe metabolism carried out by the authors indicates that during rapid haemopoiesis there was the equivalent of complete Fe exchange in the bone marrow every two hours.

—E. G. WHITE.

TRETHEWIE, E. R. (1945.) **Anticoagulant effect of perfusing organs: liver, kidney and lung.**

—*Med. J. Aust.* Sept. 15th. 328–332. 1398

T. records that "heparinized blood perfusion of the liver, kidney and lung endows the perfused blood with considerable anti-coagulant activity".

In the case of the liver, the perfused sample had a slightly decreased heparin content not to be regarded as significant unless, as T. indicates "the perfused fluid has something additional in it which affects the heparin estimation, a suggestion for which we have no experimental confirmation". In the liver a decreased prothrombin content was not sufficient to account for the inhibition of clotting. No appreciable change in the calcium content was recorded after perfusion. A decrease in the fibrinogen content was recorded, the decrease being equal to the difference in protein content of the sample after perfusion. A lesser platelet count was regarded as insufficient to account for anticoagulant action observed. A faint xanthochromia was detectable in the perfused samples. Extraction with fat solvents did not affect the anticoagulant activity of the perfused fluid, which might be anticoagulant by virtue of a lipin if the lipin is attached to a protein.

In the case of perfusion through kidneys and diseased lungs a considerable reduction in the prothrombin content of the perfused fluid could account for the anticoagulant activity of the fluid. No such reduction was observed after perfusion through normal lungs.

The methods employed in obtaining the results are discussed in some detail.—D. A. T.

EL HAGRI, M. A. A. M. (1945.) **Study of the arterial and lymphatic systems in the udder of**

the cow.—*Vet. J.* 101. 27–33, 51–63 & 75–88. 1399

The lymphatic system was studied in 42 udders collected from both destroyed and dead cows. A modification of the method of JAMIESON & DOBSON (1910.) [*J. Anat. Phys.* 45. 7] was employed for injection, with ultramarine blue as the colouring medium.

Contrary to the usual practice, the supramammary lymph nodes were classified as superficial or deep in accordance with the position and areas of the udder drained. The superficial supramammary nodes were found to be the largest and main group: they were present in all cases examined. In three specimens the nodes of either side were fused or connected by an isthmus of lymphoid tissue. In 9.5% of cases, 1–2 accessory nodes were found lateral to the main node, receiving lymph from the same areas and draining always into the main node. The deep supramammary group (1–4 nodes) were present in 57% of cases: they were situated cranial to the main node and were much smaller.

The lymph vessels were named according to the areas from which their main radicles were derived. The cutaneous lymph vessels were formed from plexuses in the dermis, their main collecting radicles passing to the superficial supramammary node direct, or by joining vessels originating in the teat or superficial parenchyma of the udder. The superficial parenchymal vessels were situated in the fascial layers, or deep to the deep fascia; generally speaking, their collecting vessels proceeded in pairs draining areas of the fore and hind quarters; without exception these vessels passed to the superficial supramammary node, in some instances *via* the accessory nodes. The deep parenchymal vessels were found to be smaller than the superficial vessels [in contrast to the findings of other authors]; they arose in the depth of the tissue and followed closely the radicles of the mammary vein to enter the deep supramammary nodes, or, if these were absent, the superficial node. The lymph vessels of the nipple were plentiful, each teat possessing 2–3 trunks which arose from two plexuses, one situated in the subcutaneous the other in the submucous layer of the teat. Communications existed between radicles of the two plexuses in the same teat, but in no case were connexions found between lymph trunks from other nipples. The vessels from the nipple pursued a course similar to that of the superficial parenchymal to enter the superficial supramammary nodes, part of the lymph from the nipple draining into the deep parenchymal vessels *via* the radicles from the submucous plexus.

The path of the lymph between nodes of

either side was subject to variation. In some specimens the lymph left the node by independent vessels but united with those from other nodes to form main efferent trunks; in others, the efferents from one node passed into a node of the same group, from which the main efferent trunk arose; in a third group a reverse flow of lymph was observed, some passing from the main node to the smaller, both then forming independent efferent trunks. In about 77% of cases, following possible inter-node associations, lymph travelled by 1-2 trunks which accompanied the mammary vessels of the same side to its ultimate destination; in the remaining 23% of cases, lymph crossed over from one side to the other. This was achieved in either reciprocal, unilateral or a totally indirect manner. The mammary lymph finally reached the deep inguinal (external iliac) nodes, then the internal iliac nodes and lumbar vessels or passed direct to the lumbar vessels. [In the light of the anatomical arrangements described the possible path of an infection is discussed, but this is rather inconclusive on account of the variable patterns found and only general principles can be accepted.]

The distribution of arteries was examined by dissection of an injected udder from a heifer and further details of the course of vessels within the organ were obtained by the examination of ten udders, one used for the preparation of celloidin casts, four others for obtaining X-ray and stereoscopic films following the injection of barium sulphate and the remainder injected with colouring medium prior to dissection.

Three vessels were found to supply the udder with arterial blood: the mammary, the internal thoracic and the internal pudic. The mammary artery was the main contributor. It appeared at the base of the udder $\frac{1}{2}$ -1 in. in from the lateral border and 3-5 in. from its caudal extremity. After a short intramammary course it divided into two branches designated in this account the common basal and the descending mammary. The common basal was the larger and passed cranially in the udder tissue, giving off branches to both quarters, which in turn supplied arteries to the teat, nipples, subcutaneous and deep areas of the udder. Evidence of the medial artery of Fürstenburg was also seen. The termination of the common basal artery varied with presence of a subcutaneous abdominal artery. The subcutaneous abdominal artery was found in only 36% of cases; it arose from the external pudic artery and passed cranially along the base of the udder on to the floor of the abdomen, where, in the region of the umbilicus, it divided into lateral and medial basal branches which anastomosed with branches of the

cranial epigastric (anterior abdominal) branch of the internal thoracic, thus establishing a link between branches of this latter artery and the mammary circulation. In cases where the subcutaneous abdominal artery was absent, the common basal of the mammary terminated by dividing into the lateral and medial basal arteries. Otherwise the common basal terminated in the udder tissue and was designated the cranial terminal mammary artery.

The descending mammary artery passed vertically in the udder tissue supplying only the caudo-dorsal area of the posterior quarters and the artery of the supramammary lymph nodes. Anastomoses between branches of this latter artery provided the only instance found of a connexion between the arterial supply of opposite sides of the udder.

The perineal branch of the internal pudic artery supplied areas of the skin of the hind-quarters; its main branch continued into the parenchyma and then passed laterally, cranially and dorsally to join the subcutaneous abdominal artery, or its equivalent, at the level of the fore-quarters. [It is not clear either from the text or diagrams if the author found this a unilateral or bilateral connexion.]

The articles are illustrated by line drawings and photographs.—C. W. OTTAWAY.

TAYLOR, E. L. (1940.) **Pseudo-rumination in the rabbit.**—*Proc. Zool. Soc. Lond.* Ser. A. **110**, 159-163. **1400**

The reingestion of faeces by the rabbit and experiments designed to establish the authenticity of reports concerning this coprophagic habit are described. Clear proof is given that caged rabbits produce two types of faeces; the first are passed during the night or early morning and are soft, covered with mucus and identical with the familiar pellets found in the cardiac region of the stomach. Night faeces are reingested as they pass from the anus and consequently it is impossible to collect them by housing rabbits on wire meshing floored cages. The second type are the day faeces which anyone familiar with rabbits knows. From an analysis it was found that the night faeces were richer in protein than the day faeces while the latter contained more fibre than the night faeces. This suggests that no further digestion of cellulose occurs as the digesta pass through the alimentary tract for the second time, but that considerable digestion of protein, presumably bacterial protein, occurs. It is also probable that vitamins of the B complex are made available to the animal by this means as synthesis of these substances is known to occur in the large intestine in rats on certain types of vitamin B-deficient diet;

in addition it is common for rats to develop the habit of reingesting their faeces in order to counteract the deficiencies in their diet. The object of coprophagy or pseudo-rumination is presumably to provide the rabbit with a supply of bacterial protein and possibly with the vitamin B complex which it would otherwise lose.—A. T. PHILLIPSON.

BECKS, H., COLLINS, D. A., SIMPSON, M. E., & EVANS, H. M. (1946.) **Changes in the central incisors of hypophysectomized female rats after different postoperative periods.**—*Arch. Path.* 41. 457–475. 1401

The central incisor teeth of 141 rats killed at intervals between six and 664 days after hypophysectomy were examined by radiographs and histological sections. The only constant and pathognomonic change observed in radiographs was thickening of the labial and lingual dentine at the expense of the pulp cavity; the earliest evidence of thickening occurred in the labial dentine 14 days after hypophysectomy. Histological study confirmed the radiographic findings and the changes found included degeneration of ameloblasts leading to deficiencies of enamel, degeneration of odontoblasts and increased thickness of the cement. Contrary to the finding of other workers, folding of the apical end of the incisors was not constant; it occurred in only 46% of rats 144 days or longer after hypophysectomy.—E. G. WHITE.

BARCROFT, J. (1944.) **Nutrition in pregnancy. Nutritional functions of the placenta.**—*Proc. Nutr. Soc.* 2. 14–18. Discussion pp. 18–20. 1402

Morphological devices for rendering the placenta more efficient include increase in barrier surface, due to a wavy contact between maternal and foetal epithelia or due to growth of foetal villi into crypts in the maternal uterine surface, distribution of the foetal capillaries over the surface of the villi rather than in their interior, arrangement of the two blood streams to run in parallel but opposite directions, and reduction in the number of layers in the placental barrier.

Consideration of the physico-chemical factors involved in the transport of substances across the placental barrier suggests that the pressure gradient causing oxygen to diffuse across the barrier is attained by the foetus having haemoglobin which takes up oxygen at very low pressures and the mother undergoing an acidosis, causing oxygen to be given up at very high pressures (the latter condition is never so extreme in women as in ewes, a fact which may be correlated with the relatively low state of development of the human being at birth); the oxygen pressure gradient falls, till at term there is practically no possibility

of oxygen being supplied to the foetus as the result of such a gradient.

Sugar is normally less concentrated in the foetal than in the maternal blood but in some animals the reverse is true, so that gradient is not the only factor causing diffusion; a mechanism involving the storage of glycogen in the placenta may be involved. Little is known of the mechanism causing water to pass the placental barrier. As regards salts, there is evidence that sodium passes across the placenta relatively easily. The passage of the small amounts of calcium and iron contained in the foetal body is probably not impeded by the placenta. The size of the foetus at birth may be limited by the size of the placenta by its power to act as a barrier to the passage of oxygen.

In discussion it was stated that the passage of vitamin A appears to be limited by the placenta, but that a deficiency in the new-born calf or infant is made up by intake in the colostrum. The placenta acts as a barrier to the passage of vitamin E and the barrier effect of the placenta towards ions such as sodium is probably due to electrostatic conditions. The transport of water is probably governed by electrostatic changes in the epithelial cells; permeability effects vary with different types of placenta, with species and with age of pregnancy. Studies of permeability should therefore include clear statements of the nature of these conditions.—R. MARSHALL.

*VARÍČAK, T. (1942.) [The surface of the chorion between the cotyledons in cows.]—*Vet. Archiv.* No. 10. p. 407. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 23rd. 246. (1943).] 1403

V. showed that the small elevations of the chorionic surface between the cotyledons persist throughout pregnancy. They may appear macroscopically as small greyish white or greyish yellow spots or, more frequently, may coalesce to form delicate stripes or an irregular network. As the foetus grows, small villous areas develop. At the end of pregnancy, a diffuse villous distribution is observed. V. concludes that these appearances indicate the presence of a partial accessory diffuse semi-placenta.—E. F. MCCARTHY.

HAMILTON, W. J., & LAING, J. A. (1946.) **Development of the egg of the cow up to the stage of blastocyst formation.**—*J. Anat.* 80. 194–204. 1404

As a result of carefully controlled experiments eggs were obtained from cows up to the stage of blastocyst formation. Each were photographed in the living state and then fixed for histological examination. Ages were related to the accepted time of ovulation and details are given of the size

and volume of eggs at all cell cleavage stages, the persistence of the zona pellucida, the disappearance of the cumulus cells shortly after ovulation in fertilized and unfertilized eggs, the nature of the cytoplasm of the ovum, the duration of the tubal journey and the volume of the vitellus. The findings are compared with those of other authors for various species and the whole article is illustrated with excellent photographs.

—C. W. OTTAWAY.

WHITNEY, L. F. (1946.) **The successful transfer of ovaries between dogs of different breed.** [Correspondence.]—*Science*. 103. 654-655. 1405

This is a preliminary report upon two cases of successful transference of ovaries taken from eight-year-old bloodhounds, not in oestrus, to young foxhounds in oestrus.

The recipients had decreasing signs of oestrus 4-5 days after the operation, but these signs then returned to their full intensity and lasted for a further 20 days. Both bitches copulated during this oestrus, but neither conceived. Oestrus reappeared in one foxhound 49 days after the start of the previous oestrus and 98 days after in the other. These second oestrous periods coincided with the normal cycles in the donors, but had no relation to the former cycles of the recipients.

It is inferred from this experiment that the initiation of oestrus is a function of the ovary rather than of the pituitary.—R. F. G. SANDERCOCK.

OLSEN, M. W., & FRAPS, R. M. (1944.) **Maturation, fertilization, and early cleavage of the egg of the domestic turkey.**—*J. Morph.* 74. 297-309. 1406

By observation of the laying schedule of a flock of 100 turkeys it was possible to estimate the time of ovulation; ova were then collected from the ovary and oviduct at autopsies carried out during the 48-hour period preceding and the eight-hour period following this assessed time. Maturation and fertilization were found to occur respectively just before and immediately following ovulation. During the 24-hour period prior to ovulation the wall of the germinal vesicle or nucleus was seen to disintegrate and the escaped fluid appeared as a thin sheet beneath the vitelline membrane. The first polar body was extruded 1-2 hours before the time of expected ovulation and was found in the matrix derived from the vesicle. The second polar body was probably extruded immediately following ovulation. Fertilization took place in the infundibulum. The first cleavage stage occurred when the egg was in the isthmus five hours after ovulation: it was meroblastic in type the first line crossing the central portion of the germinal disc. The second

cleavage divided the first two blastomeres and in the eight-cell stage the two cleavage furrows ran parallel to the first. Wide variations in cleavage patterns were found to occur in the 16-cell stage and beyond.—C. W. OTTAWAY.

KOCH, W., & SCHAEFER, L. (1944.) **Das sog. Corpus luteum der Taube. Vorläufige Mitteilung. [The so-called corpus luteum in the pigeon. Preliminary note.]—Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.** Sept. 15th. 298-299. 1407

The authors have studied by means of serial sections the changes which occur in the ovary of the carrier pigeon after ovulation. They conclude that it is incorrect and misleading to refer to the ruptured follicle as a corpus luteum, as some authors have done. The authors consider that after ovulation the resulting structure is composed of fibrous scar tissue and is in no way comparable to the corpus luteum of the mammal. It is suggested that the older term calyx should be retained.—ALFRED T. COWIE.

AUSTIN, C. R. (1946.) **Endocrinology and animal production.**—*Aust. vet. J.* 22. 48-54. 1408

This is a review article discussing the artificial induction of oestrus and ovulation, the enhancement of existing lactation and the artificial induction of lactation. The phases of the oestrus cycle and the interaction of the different hormones are represented by useful diagrams. No new work is presented.—D. C. BLOOD.

COLE, H. H., & GOSS, H. (1943.) **The source of equine gonadotrophin.**—*Essays in Biology in honor of Herbert M. Evans.* pp. 105-119. Berkeley & Los Angeles: University of California Press. 1409

In the mare, distributed over a part of the endometrium in apposition to the chorion, are specialized cup-shaped structures known as endometrial cups. These cups are not homologous with cotyledons since the foetal membranes are not attached to them. They are only present during the earlier part of pregnancy, later they are pendulous and, in all probability, become hippomanes. The authors have carried out histological and hormonal studies on these cups in four mares killed between the 62nd and 105th days of pregnancy.

The endometrial cups were found to contain more gonadotropin than any other tissue in the mare (4-12 I.U. per mg. fresh tissue). The waxy material secreted by these cups was even more potent, containing 50-314 I.U. gonadotropin per mg. fresh secretion. A considerable quantity of the hormone was present in the endometrium

between the cups. Only minute quantities were present in the chorion.

The pituitary, the chorion, and the endometrium have all been postulated as likely sources of the gonadotropin of pregnant mares. In the light of the above interesting findings, the authors discuss the question of source and conclude that equine gonadotropin is produced in the endometrium and for the most part by the endometrial cups.—ALFRED T. COWIE.

CAMERON, A. T., GUTHRIE, J. S., & CARMICHAEL, J. (1946.) The effects of oestrogens and of mild chronic starvation on the white rat.—*Canad. J. Res. Sect. E.* **24.** 105-118. 1410

Daily injections of peanut oil caused decrease in rate of growth of rats and testicular atrophy, therefore results of injections of oestradiol dissolved in peanut oil may be open to misinterpretation. Oral administration of oestradiol without peanut oil caused decrease in growth rate, relative decrease in size of kidneys, heart, spleen, muscles and ovary. It had little effect on liver, but caused marked decrease in size of testes and frequent enlargement of the adrenal glands in males, with occasional enlargement in females. In practically all cases they were discoloured. Oral administration of stilboestrol gave similar results. Rats fed oestradiol developed anorexia: hence the effects of chronic mild starvation were investigated and it was found that, while the liver was invariably affected, the adrenal glands were never enlarged or discoloured. Results in a few experiments with combined oestrogen and thyroid administration did not indicate an additive effect or a true antagonism.—R. GWATKIN.

PIERRE. (1939-40.) Endocrinologie pancréatique. [Pancreatic endocrinology.]—*Rev. Méd. vét., Toulouse.* **91.** 482-501. 1411

This is a review of the endocrinology of the pancreas. The lack of a bibliography detracts from its usefulness.—A. T. COWIE.

WILSON, T. E. (1944.) The thyroid gland and

See also absts. 1287 (chemistry of TB. lipoids), (amino acids in micro-organisms).

haemopoiesis.—*Med. J. Aust.* March 25th. 261-269. 1412

From results of experiments on rats W. concluded that the thyroid gland plays only a non-specific role in haemopoiesis.—D. A. T.

NORDBY, J. E., TERRILL, C. E., HAZEL, L. N., & STOEHR, A. (1945.) The etiology and inheritance of inequalities in the jaws of sheep.—*Anat. Rec.* **92.** 235-254. 1413

A study of the irregularities of the jaw of sheep was conducted over a period of more than seven years. Measurements were taken of the length of the skull and mandible, of the interdental space and distance from upper molars to distal end of the premaxilla, of the molar space in both jaws, of the premaxilla and also of the angle of the jaw and the angle of the incisors to the body of the mandible; the specially designed instruments which were used are described. Although in general it can be said that sheep with overshot jaws have longer skulls and shorter mandibles, the importance of correlating all measurements is stressed. Results of breeding experiments in an attempt to discover the genetic factors involved are discussed.—C. W. OTTAWAY.

O'NEIL, J. B. (1945.) The bursa synovialis pre-sternalis. A recently appearing formation in the domestic fowl.—*J. Morph.* **76.** 31-43. 1414

Reference is made to the occurrence of a cyst, classified morphologically as a bursa, situated in the connective tissue between skin and sternal crest of the domestic fowl. It was found more commonly in cockerels of the heavier breeds, appearing first at the age of 12-14 weeks and disappearing during the 24th-30th weeks of age. In size, the cyst varied from 1-7 cm. in length and 2-3 cm. in width. Histological features are given and possible causative factors are discussed. Evidence suggests that this is a new formation and the theory is advanced that it may be the precursor of a new organ.—C. W. OTTAWAY.

POISONS AND POISONING

GWATKIN, R., & PLUMMER, P. J. G. (1946.) Toxicity of certain salts of sodium and potassium for swine.—*Canad. J. comp. Med.* **10.** 183-190. [French summary.] 1415

Common salt in excessive amounts was fed to four pigs for a period of three months. Two pigs received 0.5 lb. and two 0.25 lb. daily. One of each pair received the salt in the feed, which was mixed with water. The other in each case received the salt in solution, for mixing the feed and for drinking. Throughout the experiment

the two pigs receiving the salt in the feed were very nervous. The weight gain of all four pigs was somewhat reduced. At autopsy, all organs except the kidneys, where the secreting tubules were damaged, and the pericardium, which was thickened and oedematous, appeared normal. 1 lb. of common salt in 1,225 ml. of water was fed to another pig which had been fasted overnight. It died in about 24 hours, with signs of severe gastritis.

Doses of 1-3 oz. of potassium nitrate or

5 grammes of potassium nitrite were fed to three and two growing pigs respectively which had been fasted overnight. The animals, except one which lived for nine days, died within 24 hours. Six growing pigs of varying weights were given 50 ml. of 10% potassium nitrite solution without having been fasted. None became markedly ill. Fasting increases toxicity.—THOS. MOORE.

OASTLER, E. G., & FIDLER, H. K. (1946.) **Cerebral lesions produced in healthy dogs by the intravenous injection of 4:4'-diamidino stilbene.**—*Trans. R. Soc. trop. Med. Hyg.* **39**. 538-538. **1416**

Ten animals were injected intravenously with a series of doses of freshly prepared 1% solution of the drug. In eight, macroscopic or microscopic lesions were produced in the brain. The lesions appear to be primarily vascular and this is followed by myelin degeneration and cellular infiltration. They are associated with characteristic neurological signs which occurred during the course of injections. These lesions may throw some light on the pathogenesis of certain neuropathic signs and symptoms described after the use of the drug in man.—J. M. ROBSON.

FRICK, E. J., & BOEBEL, F. W. (1946.) **Clinical observation of "1080" poisoning.**—*Vet. Med.* **41**. 196-197. **1417**

The toxic effect of "1080," sodium fluoroacetate, recently used in the U.S.A. as a rodenticide was tested on two horses. The amount used was at the rate of 5 mg. per kg. body weight. One animal received 2.5 g. in 100 ml. water by stomach tube and administration to the other was by intravenous injection in two equal doses, separated by one hour.

Death occurred ten hours after the administration *per os* and five hours after the second intravenous injection, after symptoms of marked depression, greatly enhanced pulse rate, subnormal body temperature, sweating and marked congestion of the mucous membranes.

On P.M. examination, the only visible lesion that was characteristic, was a black thick and tar-like appearance of the blood. A dog which had been fasted for 56 hours and fed on as much heart tissue as it wanted from the carcass of the injected horse, died after 18 hours and P.M. examination revealed the black, thick and tarry appearance of the blood.—H. PAVER.

NÖRR, J. (1943.) **Zur Frage der Kainitvergiftung. [Kainit poisoning.]**—*Arch. wiss. prakt. Tierheilk.* **78**. 357-368. **1418**

Kainit poisoning was suspected in a horse that had symptoms of nephritis after being given some kainit in mistake for salt. Experiments

were therefore made on 11 horses, four cows and four goats.

The horses ate little or no kainit voluntarily (up to 82 g.) when it was given alone, but larger quantities were taken when it was mixed with the food (900 g. in the course of three days, without visible effect). A dose of 750 g., given in water by stomach tube, caused thirst and increased urination, but no abnormal substances were detected in the urine in this or other experimental cases. One horse, thought to have infectious anaemia, had a febrile reaction after taking 350 g. in its food, but doses of 500 g. and 1,000 g., given in water by stomach-tube five and eight days later, respectively, caused increased thirst and urination only; there were no lesions of the stomach, intestines, or kidneys when the horse was killed the day after the last dose. Two of the four cows refused to eat the kainit by itself, the third took 142 g. without visible effect, while in the fourth, 403 g. caused temporary symptoms, including loss of appetite, increased rumen activity, decreased rumination and weakness. Four goats refused to eat kainit by itself; 50 g. were taken in food by one animal without visible effect.

The literature on kainit poisoning is reviewed and it is concluded that no single undoubted fatal case of kainit poisoning occurring under natural conditions, or under experimental conditions comparable with natural conditions, has been reported. In view of this and of his experimental findings, N. concludes that kainit is not in the strict sense a poison. Large doses consumed voluntarily may cause weakness, loss of appetite, digestive disturbances, thirst and increased urination temporarily. The extreme unlikelihood of an animal picking up a dangerous dose from dressed pastures is stressed.

In the case which prompted the experiments, the kidneys were not normal when the horse ate the kainit; it had been bought cheaply because of two attacks of "lumbago".—E. COTCHIN.

KINSLEV, C. C. (1942.) **Thalliumforgiftning hos Hunde. [Thallium poisoning in dogs.]**—*Maanedsskr. Dyrlaeger.* **53**. 521-535. **1419**

During recent years thallium [thallium sulphate] has been extensively used as a rat killer. K. reviewed the literature on the toxicity of thallium and described seven cases in dogs with characteristic clinical symptoms after access had been obtained to this agent when it had been used for killing rats. Two of the animals died after three days; the others recovered after 3-7 weeks.

—H. C. BENDIXEN.

LEGG, J., MOULE, G. R., & CHESTER, R. D. (1945.) **The toxicity of yellow-wood (Termin-**

alia oblongata) to cattle.—*Qd J. agric. Sci.* 2. 199–208. 1420

Cattle fed on the leaves of the yellow-wood tree, which under natural conditions is eaten in large amounts in drought periods, had symptoms of ocular discharge, photophobia, emaciation, anorexia and in some cases allotriophagia. Painful inflammation and exfoliation of the skin of the muzzle occurred, together with greatly increased frequency of urination. The similarity of these symptoms to those of a disease occurring naturally in an area where the plant is abundant suggested that the natural disease was caused by ingestion of yellow-wood. Lesions observed P.M. suggested a subacute to mild chronic parenchymatous nephritis caused by an irritant agent. Marked hypertrophy of the wall of the urinary bladder and retention of urine are common in naturally occurring cases. All the

See also abst. 1354 (subterranean clover).

PHARMACOLOGY AND THERAPEUTICS

JACKSON, W. (1946.) Biological effects of high-frequency currents. [Correspondence].—*Lancet*. 250. 519. 1422

The effects of high-frequency electric fields on tissue, bacteria and viruses have usually been assumed to be a consequence of a rise of temperature. NYROP [see *V. B.* 17. 20] now claims that specific electrical effects are involved, as distinct from heat effects. He applied an energizing current, of frequency 20,000 kilocycles per sec., chopped at intervals so that high field strengths could be given during short periods, and did not produce an excessive overall rise of temperature and the normal heat effects. Observations on *Bact. coli*, milk acidifying organisms and F. & M. disease virus show that the electrical treatment of the organisms has a different effect from ordinary heat treatment.

J. takes the view that the specific effects may be of thermal origin and states that two mechanisms may account for this rise of temperature associated with the presence in the specimens of free ions or of molecular dipoles. When an alternating electric field is applied, the ions oscillate linearly and the molecular dipoles orient dumb-bell fashion at the frequency of the field. Energy is extracted from the field and appears as heat in both cases. The heat is actually generated only in the immediate vicinity of the individual orienting molecules or oscillating ions and these usually constitute only a small part of the entire system. The temperature rise occurring in the immediate neighbourhood of these molecules and ions may be sufficient to destroy living tissue, though the heating of the system as a whole is

experimental animals had marked proteinuria. —D. C. BLOOD.

HORVATH, A. A. (1945.) Toxicity of vetch seed for chickens.—*Poult. Sci.* 24. 291–295. 1421

Two groups of Barred Plymouth Rock hens were fed for a period of 35 and 20 days respectively on a sole diet of untreated whole *Lathyrus sativus* (chickling vetch) and *Lathyrus cicera* (vetchling) seed, after which blood was drawn from a jugular vein and the plasma analyzed for glucose, non-protein nitrogen, uric acid, creatinine, cholesterol, inorganic phosphorus and albumin and globulin. After feeding on *Lathyrus sativus* there was a substantial gain in weight and a substantial increase in blood protein, with a nearly 50% rise in the globulin albumin ratio. *Lathyrus cicera* seemed to exert a toxic effect as indicated by a loss in weight, but no pathological changes were found P.M.—H. PAVER.

too slight to have any effect. Water, whose molecules are dipolar, exhibits a very conspicuous peak of energy absorption at a frequency close to 10^{10} cycles per second and therefore the much more complex and larger dipolar molecules involved in bacteria when present in water may be expected to exhibit maxima of energy loss at much lower frequencies. The possibility of frequency selective action on particular bacteria seems to justify investigation. J. considers that the use of N.'s technique and of frequencies higher than 20,000 kc. per sec. deserves serious consideration in medical research.—C. HORTON SMITH.

FREE, A. H., PARKER, R. F., & BIRO, B. E. (1945.) Oral penicillin—a comparison of various modes of administration.—*Science*. 102. 666–668. 1423

Whereas 60% of parenterally injected penicillin is excreted in the urine, only 14% of orally administered penicillin is so excreted. The difference is not due to action of gastric juice as similar low excretion occurs if the penicillin is administered directly into the duodenum. The main loss of penicillin is due to destruction within the body. This was observed in a case of anuria where the blood level following injection of penicillin fell fairly quickly. Oral administration with potassium citrate gives more prolonged action than administration alone or as an oil suspension or in gelatin capsules.—E. BOYLAND.

PROOM, H. (1946.) Survival of penicillin-sensitive organisms in dried penicillin.—*Lancet*. 251. 11–12. 1424

Dried pathogenic organisms normally sensi-

tive to penicillin may remain viable for long periods in contact with commercial dried penicillin, so that when the mixture is dissolved and injected, infection may ensue. Although the risk is small penicillin should be tested for sterility before use.

—E. BOYLAND.

PULVERTAFT, R. J. V., & YUDKIN, J. (1946.)

Stabilisation of penicillin solutions with phosphate.—*Lancet*. 251. 265–267. 1425

When penicillin is autoclaved in water all activity is lost, but when it is autoclaved in culture solutions some activity remains: this is due to the presence of phosphate in the medium. Phosphate ion has a specific effect in stabilizing penicillin solutions, the degree of stabilization and the optimum concentration of phosphate depending on the individual sample of penicillin. The addition of phosphate will keep penicillin active at room temperature for longer periods, will allow sterilization by boiling for 10 min. with only slight loss of activity and will afford some protection against the destruction of penicillin by rubber, thus enhancing its use by continuous parenteral injection.—R. SCARISBRICK.

ATKINSON, N., SHEPPARD, R. A. W., STANLEY, N. F., & MELVIN, P. (1944.) **Antibacterial substances produced by moulds. 6. The production of crystalline penicidin.**—*Aust. J. exp. Biol. med. Sci.* 22. 223–226. [For part 5, see *V. B.* 16. 202.] 1426

ATKINSON, N., SHEPPARD, R. A. W., STANLEY, N. F., & RAINSFORD, K. M. (1944.) **Antibacterial substances produced by moulds. 7. The activity of a further group of Australian strains of penicillium and aspergillus.**—*Ibid.* 227–230. 1427

6. Loss of activity on second or third subcultivation of strains of *Penicillium* used in production of penicidin proved an obstacle to investigations on penicidin. Methods employed for obtaining reactivation of these strains were drying *in vacuo* over P_2O_5 and alteration in the type of culture media. Some success was obtained with the latter method. No return of activity was obtained with the former method.

The temperature of incubation influenced the antibacterial activity of the filtrates. Thus the maximum activity of strain 9 incubated at 20°C. was reached on the fourth day, but at 25°C., maximum activity was on the fifth day. Similarly, at 20°C. activity disappeared at nine days, and at 25°C. at the seventh day. Penicidin was actively antiluminescent, and antiluminescent titration was found satisfactory for estimation of the crude and partially purified preparations investigated for penicidin content.

Methods of extraction and purification of penicidin are discussed.

7. The antibacterial activity of 50 strains of *Penicillium* and two strains of *Aspergillus* was investigated. Fifteen strains of *Penicillium* inhibited bacterial growth. Fourteen of these inhibited growth of *Staph. aureus* and of these, eight strains also had activity against *S. typhi*. Strain 68 was active against *Str. viridans* only. Both of the strains of *Aspergillus* were active against *Staph. aureus* and *S. typhi*.

Strains 87 and 88 were considered to be active against *Staph. aureus* by virtue of penicillin produced. Metabolism solutions for strains 67, 76 and 94 contained penicidin.

The methods of incubation of mould cultures, and of assaying bacterial inhibition are described. Among Australian strains of *Penicillium* only two types of activity have appeared: these are considered to be due to the production of either penicillin or penicidin. An almost equal number of strains of each type has been isolated. No Australian strains producing citrinin are known.

—D. A. TITCHEN.

VESELL, H., GROSS, I. H., & SUSSMAN, R. M. (1946.) **Urea as an adjunct to sulphonamide therapy. Report of its successful use in a case of subacute bacterial endocarditis.**—*J. Lab. clin. Med.* 31. 444–452. [Authors' conclusions copied *verbatim*.] 1428

The use of urea as an adjunct in treatment with sodium sulfadiazine is described.

A cure of subacute bacterial endocarditis so treated, with prompt recovery, is reported.

While penicillin is preferable in cases of subacute bacterial endocarditis due to alpha hemolytic streptococcus, in infections where large doses of sulfadiazine are required the use of urea as an adjunct may be of considerable aid. This combined sulfonamide and urea therapy may be desirable in some cases resistant to treatment with penicillin.

WINNEK, P. S. (1946.) **An intestinal antiseptic: 2-sulfanilamido-5-carboxythiazole.**—*Science*. 103. 719–720. 1429

This new sulphonamide derivative is poorly absorbed from the gut and is non-toxic but effective in treating dysentery. It rapidly reduces the number of *Bact. coli* in faeces of dog and man.

—E. BOYLAND.

GÖTZE, R. (1945.) **Behandlung der Kerato-Conjunctivitis infectiosa des Rindes mit Sulfonamiden. [Treatment of infectious kerato-conjunctivitis of cattle with sulphonamides.]**—*Tierärztl. Z.* No. 2/3. pp. 25–28. Discussion pp. 26–28. 1430

From observations made on the experimental

treatment of eight cattle with the severer forms of rickettsial conjunctivitis it is claimed that the twice daily intravenous injections of the sulphonamide preparations, eleudron [sulphathiazole] or 1,105, administered for five days, leads to recovery in 14-18 days, as against the weeks or months required for natural recovery, or recovery under local treatment.

In discussion it was suggested that the severer forms of the infection (keratitis, ulceration of the cornea and microphthalmus) were caused by secondary bacterial invaders and that the sulphonamides acted on these organisms. WAGENER stated that MITSCHERLICH had been unable to produce conjunctivitis with bacteria isolated from infected eyes, but that after six passages of the rickettsia only conjunctivitis developed, the complicating bacteria having been apparently eliminated. Rickettsiae were found to persist in the conjunctiva of recovered animals and were found to be still present after treatment with sulphonamides.—U. F. RICHARDSON.

HAWKING, F., & GREEN, F. H. K. (1945.) **The medical use of sulphonamides.**—*War Memo. Med. Res. Coun.* No. 10. pp. 71. London: H.M. Stat. Off. 2nd Edit. 1s. 3d. 1431

The second edition of the memorandum has been greatly expanded. The chemistry and pharmacology of sulphonamides are described, but only the substrate competition theory of the mode of action is discussed. The dosage of sulphonamides in various types of conditions is given, in the light of concentrations to be produced in the blood. The importance of limiting the duration of administration is stressed. The toxic effects which may be produced are described in detail and a table gives their relative frequency with sulphanilamide, sulphapyridine, sulphathiazole and sulphadiazine. An extensive section deals with the treatment of specific infections and with the prophylaxis of some of them, *viz.* streptococcal infection (haemolytic and non-haemolytic), meningococcal infections and other forms of meningitis, pneumonia, staphylococcal infections, peritonitis, urinary tract infections, venereal diseases (gonorrhoea, lymphogranuloma inguinale, chancroid), wounds, gas gangrene, burns, intestinal infections and dermatological conditions. Both systemic and local treatments are considered and details are given of a sulphonamide cream suitable for application to burns, etc. A number of other conditions, *e.g.*, actinomycosis, diseases and injuries to the eye and TB. (use of sulphones), are more briefly considered. A special section deals with the prophylactic use of sulphonamides in surgical operations on the large intestine, with cerebrospinal fever, bacillary dysentery, rheumatic

fever and various respiratory infections. Methods of estimating sulphonamides in body fluids, of testing for sulphonamide resistance in bacteria and of sterilizing sulphonamide powders are given in appendices.—J. M. ROBSON.

JENNINGS, M. A. (1945.) **Activity of helvolic acid against *Mycobacterium tuberculosis*.** [Correspondence.]—*Nature, Lond.* 156. 633. 1432

Helvolic acid, an antibiotic produced by *Aspergillus fumigatus*, completely inhibited the growth of *M. tuberculosis* from human sputum in slide cells at dilutions of 1:10,000. Partial inhibition was obtained with dilutions of 1:100,000.—E. BOYLAND.

FAGET, G. H., POGGE, R. C., & JOHANSEN, F. A. (1946.) **Present status of diasone in the treatment of leprosy.** Brief clinical note.—*Publ. Hlth Rep., Wash.* 61. 960-963. [Authors' conclusion copied *verbatim*.] 1433

Diasone, a derivative of diamino diphenyl sulfone, is suitable for oral administration in the treatment of leprosy. Patients with leprosy usually improve clinically within the first 6 months of treatment with diasone in adult doses of 1 gm. daily.

BARRY, V. C., & McNALLY, P. A. (1945.) **Inhibitory action of dialkyl succinic acid derivatives on the growth *in vitro* of acid-fast bacteria.** [Correspondence.]—*Nature, Lond.* 156. 48-49. 1434

The monomethylesters of α -methyl- α -*n*-dodecyl succinic acid inhibit the growth of acid fast bacteria such as *M. phlei* and *M. tuberculosis*. Anilides of other substituted succinic acids also inhibit the organisms but the active compounds are all haemolytic.—E. BOYLAND.

ANON. (1946.) **Buttercups and antibiotics.**—*Brit. med. J.* Oct. 5th. 499. 1435

This article is a brief review of five papers on the occurrence of antibiotics in higher plants. Of 2,300 species examined by OSBORNE [see *V. B.* 14. 357], 63 genera contained substances inhibiting growth of *Bact. coli* and *Staph. aureus*; Ranunculaceae contained the most active substances. In studies by LUCAS & LEWIS [see *V. B.* 16. 409], leaves of Scotch thistles, mulleins and peonies and fruits of rose, saxifrage, and other families were found to contain antibacterials: honeysuckle contained two principles inhibiting (a) *Bact. coli* and *Staph. aureus* and (b) coliform but not Gram-positive bacilli.

Extracts of buttercups and of *Anemone pulsatilla* were found by SEEGAL & HOLDEN [see *V. B.* 15. 407], to be active against Gram-positive, Gram-negative and acid-fast bacteria. The active principle of *A. pulsatilla* is protoane-

monin (similar in structure to clavacin, crepin and penicillic acid), which inhibits *Staph. aureus*, *Bact. coli* and *Candida albicans* in dilutions up to 1:100,000. Its toxicity is not known.—R. S.

SCHNITZER, R. J., LAFFERTY, L. C., & BUCK, M. (1946.) **The role of antibodies in experimental drug resistance of *Trypanosoma equiperdum*.**—*J. Immunol.* **54**, 47–57. 1436

In investigating the influence of antibodies on the development of drug resistance by trypanosomes, use was made of *T. equiperdum* in mice and rats. The drug *p*-rosaniline hydrochloride was chosen, as there is difficulty in producing resistance to it in mice and because its efficiency in mice is greater than in rats, indicating an influence of the immunity response of the host.

A comparison was made between the classical "relapse" method of producing drug resistance, the "short-passage" method, in which the trypanosomes are transferred to a new mouse within 4–8 hours of the administration of the drug, and the "splenectomy" method of treating infected splenectomized animals with a subcurative dose of the drug, followed by daily increasing doses. In mice the splenectomy method induced drug resistance most rapidly, the short-passage method being superior to the classical relapse method. In rats splenectomy alone was not sufficient to cause the development of drug resistance and had to be combined with short passage. The development of drug resistance in splenectomized mice was retarded by the administration of trypanocidal rabbit serum. It is claimed that these findings prove that antibodies interfere with the development of drug resistance.—U. F. RICHARDSON.

FAURE-BRAC. (1945.) **Le traitement de la leishmaniose canine par la diamidinodiphenoxypentane. [Treatment of canine leishmaniasis with pentamidine.]**—*Bull. Acad. vét. Fr.* **18**, 203–213. 1437

Measures adopted for the control of human leishmaniasis in the Mediterranean littoral have included the destruction of infected dogs; attempts to immunize dogs, have not yet been on a sufficient scale to warrant a report. Treatment of infected dogs with antimony compounds, though giving temporary improvement, has not given sterilizing cures. Twelve cases are now recorded of treatment with pentamidine from which it is concluded that this drug produces rapid clinical recovery, and probably sterilization, as relapses have not been recorded.

The drug is used as a 1% solution, and should be given intramuscularly at a dose of 0.002 g. per kg. until 10–15 injections have been administered.

One case is recorded in which intravenous

injection of the drug caused death. Subcutaneous injection caused necrosis and a severe sloughing of surrounding tissue. No toxic symptoms occurred after intramuscular injection. [Except for the absence of relapses there is no evidence that the treatment was sterilizing.]—U. F. R.

BRACKETT, S., WALETZKY, E., & BAKER, M. (1946.) **The relation between pantothenic acid and *Plasmodium gallinaceum* infections in the chicken and the antimalarial activity of analogues of pantothenic acid.**—*J. Parasit.* **32**, 453–462. 1438

P. gallinaceum infections induced by the inoculation of blood containing trophozoites were found to be suppressed in fowls fed diets deficient in pantothenic acid and also in fowls treated orally with analogues of pantothenic acid, but infections induced by the inoculation of sporozoites from mosquitoes were not influenced by such treatment. The analogues of pantothenic acid have the same effect on the erythrocytic phases of this infection as does the deficiency of pantothenic acid in the host. The apparent specific interference of these analogues with the pantothenic acid metabolism of the parasites suggests the possibility of their interfering with the pantothenic acid metabolism of the host.

It is suggested that the blood phase of the infection requires pantothenic acid, whilst the tissue phase may either not require the vitamin, or find sufficient of it in the tissues. The suppressive action of the analogues is completely antagonized by the addition of pantothenic acid to the analogue containing diet. The most active analogue tested, pantoyletauramido-4-chlorobenzene, proved to be four times as active as quinine in a standard four-day infection induced by trophozoites, and was toxic only at doses far above those required for therapeutic effect.—U. F. R.

STONE, J. D., & BURNET, F. M. (1945.) **The action of halogens on influenza virus with special reference to the action of iodine vapour on virus mists.**—*Aust. J. exp. Biol. med. Sci.* **23**, 205–212. 1439

Iodine vapour was found to be a very potent inactivating agent for virus mists. A special chamber is described in which known amounts of influenza virus could be exposed to known amounts of iodine vapour immediately before the introduction of mice to test the residual infectivity. Minute quantities of iodine vapour were effective. The protective action was not so complete if the virus mist was first dehydrated.

Chlorine and bromine vapour had a similar protective action.

It was also found that the halogens were

capable of destroying the haemagglutinating properties of the virus.

The conditions governing the effectiveness of halogens as air sterilizing agents are discussed, together with the possibility of using iodine-impregnated masks when dealing with highly infectious patients, *e.g.*, in pandemic influenza, and possibly, pneumonic plague and psittacosis.

—N. WICKHAM.

HELSON, G. A. H., & WATERHOUSE, D. F. (1945.)

The present status of D.D.T. as an insecticide.

—*J. Aust. Inst. agric. Sci.* 11. 172-178. 1440

This is a comprehensive review of the uses of D.D.T., including information on forms in which it may be used (sprays, emulsions, solutions) and methods of application. Toxicity to insects of agricultural, medical, veterinary and household interest is discussed, and there are notes on its toxicity to higher animals and plants.

—H. McL. GORDON.

PEAIRS, L. M. (1946.) **DDT and hornfly populations.**—*J. econ. Ent.* 39. 91-92. 1441

Dispersible D.D.T., 2:10,000 in water, was sprayed on the backs of cattle until they were thoroughly soaked. On one farm in Virginia, 65 heifers not near other sources of infestation were kept free of *Lyperosia* for the whole season by one treatment in mid-July. This long protection was much greater than that given by greater concentrations in Florida.—T. SPENCE.

BARTELS. (1944.) **O-Dur, ein neues Präparat zur Behandlung der Schafräude. [O-Dur, a new preparation for treating sheep scab.]**—*Tierärztl. Z. No. 2.* pp. 26-27. 1442

O-Dur is a phenol preparation in powder form, which, when mixed with water, goes partly into solution and partly into suspension. For a slightly affected flock, a solution of 0.5% is sufficient to cure scab, but for a badly affected flock or for scab of long standing, 0.75%-1% should be used.

Dipping trials were carried out in June with a 1% solution at 30°C. The sheep were kept in the bath for 2 min. They were redipped after a ten-day interval in a 0.5% solution and no further treatment was necessary.—B. A. T.

ANON. (1945.) **Vitamin K in urticaria.**—*Brit. med. J.* August 18th. 224. 1443

An interesting study has been made by BLACK (1945) of the prothrombin content of the blood in urticaria and the therapeutic action of vitamin K. The investigation was carried out on 156 patients, in whom the disease was chronic and of unidentified origin. In 65% of these patients the prothrombin values were lowered, in some instances very considerably, so that the coagulation

time was twice as long as normal. Oral administration of vitamin K, in the form of menaphthone, gave relief in over 60% of cases, the relief being most marked in those with a prolonged coagulation time. Duration of treatment was 1-4 weeks and though relapses occurred in 30% of the patients, further administration of the vitamin again ameliorated the condition. If these findings can be confirmed, a great advance will have been made in the treatment of this disease.—E. M. C.

ENNOR, A. H. (1940.) **The influence of anterior pituitary extracts on the detoxication mechanisms of the dog.**—*Aust. J. exp. Biol.* 18. 163-169. 1444

Two dogs were given crude saline extracts of fresh ox pituitary glands for 23 and 54 days respectively. This produced only transient glycosuria in one animal but had a pronounced effect on the glucose tolerance curve of both animals.

Sodium benzoate was administered orally, subcutaneously and intraperitoneally and the urinary excretions of benzoyl-glycuronic acid and glucose were estimated. Glucose regularly accompanied the excretion of benzoyl-glycuronic acid in the treated animals, but could not be detected in nine untreated control animals. One hundred and fifty days after the administration of anterior pituitary extract was discontinued, the elimination of sodium benzoate followed the course observed in normal animals.—W. K. WHITTEN.

YOFFEY, J. M., & BAXTER, J. S. (1946.) **Some effects of pituitary adrenotropic hormone (PATH), extract of suprarenal cortex, and colchicine on the haemopoietic system.**—*J. Anat.* 80. 132-138. 1445

The subcutaneous injection of PATH or of aqueous extracts of the adrenal cortex in rats produces a fall in the blood lymphocytes in 3-5 hours. Continued daily injection for four weeks of either of these preparations or both usually tends to lower the blood lymphocytes; PATH also produces regressive changes in lymph nodes and thymus, whereas cortical extract gives rise to a slight hyperplasia of lymphoid tissue. The subcutaneous injection of colchicine is followed after 10-17 hours by widespread destructive changes in lymphoid tissue and by the appearance in the circulating blood of immature bone marrow cells, both myeloid and erythroid.—J. M. ROBSON.

I. BRAZIL, O. V., SEBA, R. A., & CAMPOS, J. S. (1945.) **Curare—Obtenção e farmacologia do dimetil eter da metil beberina. Curare—the pharmacology and methods of obtaining beberine dimethylether methochloride.**—*Bol. Inst. Vital. Brasil.* 5. 79-96. [English summary.] 1446

II. CAMPOS, J. S., & BRAZIL, O. V. (1945.) Curare—Sobre o emprego do dimetil eter da metil bebeerina em clinica. [Curare—the clinical use of bebeerine dimethyl methochloride.—*Ibid.* 97–114. [English summary.] 1447

III. DE MACEDO, L. R. T., & XAVIER, M. F. (1945.) Curare e substâncias curarizantes. Do emprego do dimetil eter da metil bebeerina em Medicina Veterinária. [Curare and curare substitutes. The use of bebeerine dimethylether methochloride in veterinary medicine.—*Ibid.* 115–132. [English summary.] [See also *V. B.* 17. 47, abst. 208.] 1448

These three articles describe an attempt to find a substitute for curare. The authors prepared bebeerine dimethylether methochloride from bebeerine, an alkaloid obtained from the roots of *Chondrodendron platyphyllum* a South American tree belonging to the Menispermaceae. In III, there is an account of the use of this product on 32 dogs, 36 horses and 25 cattle. There are photographs of some of the animals concerned, under the action of the compound.

WRIGHT, J. G. (1946.) The surgical treatment of bursitis of the equine poll and withers.—*Vet. Rec.* 58. 93–97. 1449

Treatment of 18 cases of bursitis of the poll or withers by radical operation is described. In nine, the poll was involved, in eight, the withers and in one, both. Twelve of the cases were closed at the time of operation. The operation comprised complete exposure of the diseases focus with provision of lateral drainage where necessary. Details of the technique are given.

Of the 18 animals involved, 12 recovered fully. Six of the ten poll cases recovered; all healed, but in two cases meningitis developed about a year later. A further case was destroyed after working because of suspected TB. and in the fourth case poll and withers were both involved and the withers did not heal. Of nine withers cases, seven recovered. In one case a sinus developed and in the other there was deep seated abscess formation.

The 16 cases which made satisfactory post-operative progress were hospitalized for an average of 36 days. The average usage of sulph-anilamide was 3 lb. per case. Blood from 12 cases was examined for *Br. abortus agglutinius*. Nine were positive and the organism itself was isolated from two poll cases. In no case was the nematode *Onchocerca cervicalis* found on cursory examination, but no detailed search was made.—D. D. O.

JORDAN, R. C., & JACOBS, S. E. (1946.) Studies in the dynamics of disinfection. VII. The reaction between phenol and *Bact. coli*: the

effect of temperature on the usually accepted concentration exponent and the calculation of a more satisfactory exponent based on theoretical considerations.—*J. Hyg., Camb.* 44. 421–429. [Authors' summary copied *verbatim.*] 1450
[For part VI, see *V. B.* 16. 414.]

VII. Calculated values of the virtual sterilization time (*v.s.t.*) have been used in an analysis of the effect of temperature on the concentration exponent of the reaction between phenol and *Bact. coli* cultures under rigidly standardized conditions.

Within the experimental range of temperature and concentration employed, the exponent calculated from the formula $C_n \times t = K$ was satisfactorily constant from 20° to 35° C., but it apparently increased at 39° C. This formula is unsatisfactory in that it cannot apply to concentrations near the threshold value without a change in the value of *n*. Accordingly, a new method of treating these data has been suggested which makes allowance for this threshold or minimum concentration. A corresponding 'maximum' concentration has been arbitrarily fixed at which the *v.s.t.* is 10 min. and the value of (*v.s.t.*–10) thus varies from infinity to zero between these concentration limits. Sigmoid curves asymptotic to ordinates at the minimum and maximum concentrations must be obtained when log (*v.s.t.*–10) is plotted against concentration and the equation of the Pearl-Verhulst logistic curve, which is of the required type, has been used successfully to express the relationship between *v.s.t.* and concentration at constant temperature.

One of the constants of this formula partakes of the nature of a concentration exponent and this may be constant over the full effective concentration range and for all temperatures.

The logistic formula relating *v.s.t.* to concentration at constant temperature is closely related to that connecting *v.s.t.* with temperature at constant concentration. The two formulae become interconvertible if certain assumptions are made concerning the relationships between the minimum and maximum concentrations and temperature.

TWORT, C. C., WHITE, L. J., & BAKER, A. H. (1946.) The significance of volatility and water solubility in disinfection processes.—*J. Hyg., Camb.* 44. 451–462. [Authors' summary copied *verbatim.*] 1451

Solubility of a germicide in the medium (water or air) in which it is operating appears often to be the most important physical characteristic governing degree of activity on bacteria (partition law). Evidence of the importance of solubility has only been derived from a study of the action

of phenols and glycols, a high bactericidal activity never being registered unless solubility was low. Other types of germicide were exceptional in that high solubility coincided with high bactericidal activity: iodine and maleic anhydride in the air; mercuric chloride and many organic acids in the test tube.

Mixtures of germicide and bacteria as used in the test tube were sprayed into the air, the bactericidal effect being usually increased or decreased according as to whether it was originally low or high in the test tube. The vapour pressures of most of the germicides used were deduced from the Clausius and Clapeyron formula, the boiling-points being determined by the bubbling method. When the amount of a phenol used in the air is approximately proportional to the vapour pressure, the bactericidal effects of the different samples are

more nearly parallel when the degree of saturation of the air is low than when it is high. No phenol with a vapour pressure lower than 0.0021 mg. Hg, and tested at full saturation, sterilized the air during the first minute of the experiment, while all samples with, at least, 10 times this vapour pressure did so when at 12.5% saturation.

Among the phenols tested, especially those having low vapour pressures, the concentration (w/w) in air is very much less than the concentration in water in the respective experimental conditions, where but few survivors is the criterion of efficacy. Owing to a number of different factors, the rapid decline in the initial concentration is more likely to be met with under air than under test-tube conditions.

See also *absts.* 1314 (tryparsamide), 1332 (nicotinamide in skin affections), 1476 (penicillin).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

MILLENKY, A., & BRUECKNER, H. J. (1941.) **A comparative study of high-temperature short-time and holder pasteurization.**—*Bull. Cornell agric. Exp. Sta.* No. 754. pp. 26. 1452

Flash pasteurization, the heating of milk momentarily to some high temperature, was abandoned in the U.S.A. in 1900 in favour of high temperature-short time pasteurization in which every particle of milk is heated to at least 160° F. for at least 15 sec.

The experiments described in this article were a comparison of creaming in milk pasteurized by high temperature-short time and holder methods, a comparison of the efficiency of bacterial destruction in milk pasteurized by these two methods and a comparison of the preservation of vitamin C and incidence of oxidized flavour in milk similarly treated.

The authors concluded that creaming in milk pasteurized by the high temperature-short time method at 163°F. was equal to that in milk pasteurized by the holder method (24-hour samples). Milk must be pasteurized at approximately 165°F. in the electric machine to equal the bacterial destruction obtained with the holder method. This is especially evident when bacteria are very resistant in type. A highly resistant strain of *Bact. coli* was completely destroyed by electric pasteurization. Pasteurization with the electric unit effectively preserved the vitamin C present in raw milk for a period of 48 hours. No electrically pasteurized milk gave evidence of oxidized flavour in 24 hours. Phosphatase readings on electrically pasteurized milk were con-

sistently low and in every instance were slightly below the readings obtained on similar milk pasteurized by the holder method.—D. S. R.

VAN RENSBURG, S. W. J. (1946.) **Low solids-not-fat content of milk in South Africa.**—*Fmg. S. Afr.* 21. 217-228. 1453

The standard laid down for milk in South Africa is that "No person shall sell as milk, milk to which any substance has been added or from which any part of any of its constituents has been removed, or which contains less than three parts per cent of milk fat or less than 8.5 per cent of milk solids-not-fat".

A study was made during 1939-46 of the various factors influencing the quality of milk. These were found to be bovine mastitis, seasonal and nutritional conditions, the stage of lactation, advancing age, general management, individuality, and conformation and structure of the udder. As effective measures for diagnosis, control and prevention of mastitis have been evolved, there is no excuse for selling milk from diseased udders. This is one of the chief causes of a lower solids content in milk.

While solids other than fat are generally thought in Europe and the U.S.A. to increase in winter and decrease in summer, the reverse is found in South Africa. A table is included to demonstrate this fact. While many cows in disease-free herds secrete milk with solids below the recognized standard, the average for such a herd is usually above.

The article contains tables which illustrate

the average of milk solids other than fat at different lactation periods and at different ages and gives notes and photographs on different types of udders.—D. S. RABAGLIATI.

FABIAN, F. W. (1946.) **Cheese as the cause of epidemics.**—*J. Milk Technol.* **9.** 129–143. [Author's summary and conclusions copied *verbatim*.] 1454

Cheese has caused a great many epidemics of disease. The organisms most commonly associated with cheese-borne infections are *E. typhosa*, the *Salmonella* group such as *Salmonella aertryke*, *Salmonella supestifer*, and *Salmonella schottmülleri* of the *Brucella* group *Brucella melitensis*, and to a lesser extent *Clostridium botulinum*, and streptococci. There are no reports in the literature of undulant fever due to *Brucella abortus* or septic sore throat due to streptococci caused by eating cheese despite the fact that these organisms surely must be present at times in raw milk made into cheese. There is no evidence that *Escherichia coli* is a health hazard although it is an economic one in cheese.

The conflicting results regarding the viability of *E. typhosa* in the experiments with commercially prepared cheese may be due to the type and strain of *E. typhosa* used by the different investigators. WADE and SHERE [1928] used a culture of typhoid bacilli which they isolated from a 57 year old woman who had had typhoid fever in 1900 which was about 27 or 28 years previous. So it may have been an R or rough strain of the organism. CAMPBELL and GIBBARD [*V. B.* **16.** 84] used a smooth Vi strain which might be more resistant than the rough strain.

From all the available information it would seem that the 60-day holding period is too short a time. The cheese does not have time to ripen and there may also be too many viable pathogenic bacteria present at the end of this time. A 90-day holding period should be the minimum time required. This gives the cheese time to ripen, and practically all pathogenic bacteria should have died or have become attenuated by the end of this time. A 120-day holding period such as Colorado requires is much better and safer for cheese made from raw unpasteurized milk.

Pasteurization is the only safe procedure to recommend or require. It is not only a safe procedure but also an economic one since cheese made from pasteurized milk or cream can be ripened in half the time because it can be ripened at a higher temperature, 60°F. instead of 40°F. or lower. Furthermore, if pathogenic bacteria are present, they will die more rapidly at the higher than at the lower temperature in cheese.

A combination of pasteurization and a 90-day holding period would be more nearly ideal as well

as economically sound since it would produce a safe as well as a mature cheese.

GODING, R. F., & CASON, L. (1946.) **Test for boric acid as a preservative in milk.**—*Amer. J. clin. Path.* **16.** 95. 1455

The authors found that after the addition of 4% lactic acid to milk containing boric acid, a green flame appeared when the sample was burned, as in the flame test for boric acid. Concentrations as low as 0.5% could be detected in this manner. Since less than this amount did not delay growth of bacteria, the method is recommended as both time-saving and reliable.

—D. S. RABAGLIATI.

GRÜTTNER, F. (1944.) **Leberegel und Fleisch-vergiftungsbefall. [Liver flukes and meat poisoning.]**—*Z. Fleisch- u. Milchhyg.* **54.** 138–135. 1456

After *S. enteritidis* had been isolated from the meat of a slaughtered calf, seven heifers of the 15 cattle on the same farm were found to be permanent excretors of this micro-organism. They were slaughtered and it is stated that in each the hepatic parenchyma was affected with different bacteria. All seven heifers had liver fluke infestation and it is suggested that the bacterial infection resulted from this parasitic infestation. G. suggests that liver fluke predisposes to secondary bacterial infection more commonly than is usually realized and that in districts of heavy fascioliasis, special attention should be paid to the possibility that bacteria may be excreted by affected cattle.

The author infers that in routine meat inspection, as carried out in Germany, regulations regarding the presence of *S. enteritidis* should be strict.—C. AHARONI.

JENSEN, H. (1945.) **Dyrebeskyttelseslovgivningen i Skandinavien. [Legislation for the protection of animals in Scandinavia (Precautions against fire).]**—*Maanedsskr. Dyrlaeger.* **57.** 213–234. 1457

In 1924 the Scandinavian Animal Protection Union was founded, with representation from Denmark, Norway and Sweden. The Danish law of 1926 regarding fire police measures in country districts provides for minimizing the risk of fire in stables, but in Norway and Sweden, fire regulations apply only to closely built-up areas. In 1944, the Swedish National Union of Animal Protection Societies petitioned Parliament to introduce measures to reduce the risk of fire in stables. This question has also engaged the attention of the Swedish Fire Protection Society. The regulations for the protection of animals in force in Norway, Sweden and Denmark are quoted, together with the penalties for their infringement.—R. PETER JONES.

— (1945.) Se amplian disposiciones del decreto reglamentario de la ley No. 10-045. [Uruguay: Amplifications of the law relating to tuberculin testing of herds.]—*Bol. mens. Direcc. Ganad., Montevideo*. 28. 21-22. 1458

Previous regulations in this decree applied only to the Departments of Montevideo and Canelones. Part of the decree provided for the tuberculin testing of cattle in these districts and compensation for slaughter of positive reactors. It has now been found necessary to augment the regulations in order to exclude those animals which have been brought into the above districts solely to take advantage of the regulations. Therefore, animals presented for the tuberculin test must be accompanied by a certificate stating their place of origin and the date and result of any previous test.

Animals coming in from other departments must have passed the tuberculin test. If they react positively in either of the two stated departments, they must be marked with the letter T and slaughtered, no compensation being payable

See also absts. 1280-1284 (control of TB.), 1285 (TB. in meat inspection), 1292 (erysipeloid).

to the owner, who is, however, able to recover the value of the meat.—I. W. JENNINGS.

DE JONG, D. (1941.) Veterinaire voorlichting. [Veterinary instruction of the public.]—*Tijdschr. Diergeneesk.* 68. 14-16. 1459

The article deals with the needs of stock-owners for veterinary information relating to the management of their stock and the prevention and control of disease. It is feared that until a Netherlands' State Veterinary Intelligence Service is instituted, the officers of the Agricultural Department will be forced to answer enquiries which could be better dealt with by veterinarians. There is a great need for enlightenment on such subjects as distomatosis in sheep, strongylosis in fowls, mange in different animals, ox-warble fly control, etc.

The slaughter of stock in primitively equipped butcheries instead of at abattoirs is deplored, as are emergency slaughter without stunning, the non-inspection of farm-killed meat and the skinning of dead animals which should be destroyed intact.—P. L. LE ROUX.

LIVESTOCK HYGIENE

JONES, L. T., & ELLIOTT, H. G. (1944.) Copper deficiency in the Busselton-Augusta district. A review of its history and investigation with special reference to the re-establishment of subterranean clover.—*J. Dep. Agric. W. Aust.* 11. 342-357. 1460

The use of copper sulphate at the rate of

10 lb. per acre in this copper-deficient area resulted in improved health and production of stock grazing on treated areas. A marked improvement in subterranean clover growth was apparent. The application appeared to be effective for at least four years.—D. C. BLOOD.

ZOOTECHNY

FRENCH, M. H. (1946.) Growth rates of hair on grade European and indigenous breeds of cattle.—*E. Afr. agric. J.* 11. 181-183. 1461

In a study on a small number of cattle the following observations were made:—

The rate of hair growth corresponded to the minimum shade temperature (eleven animals examined at monthly intervals for a year). Short-coated animals had slower hair growth than long-coated ones (five short coats compared with six long). Three-quarter Friesians appeared to be better suited to tropical climates than three-quarter Ayrshires (four of the former compared with two of the latter). Rapid hair growth and long coat were factors rendering an animal unsuitable for tropical conditions.—R. MACGREGOR.

HAQ, I. (1945.) Bone industry in India.—*Indian Fmg.* 6. 458-461. 1462

It has been estimated that 1,391 thousand

tons of bone, worth nearly 5½ million pounds sterling, are produced annually in India. Of these, 70% are collected. Methods of collection, storage and seasoning are primitive. To develop the industry, more sale centres should be opened, bones should be sorted into fresh and dry, horns and hoofs, knuckles and marrows, etc. and raw bones handled more carefully. The preparation of bone products should be encouraged both in factory and cottage. Research should be conducted on the seasoning, storage and suitability of bones for various products and a statistical survey is required on their best use.—M. P. JOHARI.

SCOTT, J. P. (1945.) Social behavior, organization and leadership in a small flock of domestic sheep.—*Comp. psychol. Monogr.* 18. No. 4. 1-29. 1463

An analysis of social behaviour and relationship amongst sheep, was made over a period of

four years on the descendants of two ewes. The investigation was made in order to have experi-

mental material for a proposed comparative analysis of human sociology.—P. F. S.

See also *absts.* 1342-1345 (artificial insemination), 1394 (acclimatization).

TECHNIQUE AND APPARATUS

McCLUNG, L. S., HEIDENREICH, P., & TOABE, R. (1946.) **A medium for the Nagler plate reactions for the identification of certain clostridia.**—*J. Bact.* 51. 751-752. 1464

The authors developed the plate reaction described by HAYWARD (1941-43), based on Nagler's reaction, for the rapid identification of *Cl. welchii*. The reaction depends upon the splitting of insoluble fatty material in human blood serum or egg-yolk by certain toxins, which is shown by a zone of precipitation around positive colonies in plate cultures. Details of the medium used are given.—D. L. HUGHES.

PARKES, A. S. (1946.) **Feeding and breeding of laboratory animals. I. Rat and mouse cubes and cube containers.**—*J. Hyg., Camb.* 44. 491-500. 1465

BRUCE, H. M., & PARKES, A. S. (1946.) **Feeding and breeding of laboratory animals. II. Growth and maintenance of rabbits without fresh green food.**—*Ibid.* 501-507. 1466

I. With a view to simplifying the feeding of rats and mice used for experimental purposes, a cubed diet was prepared with a composition of 80% rolled or ground oats, 35% wheat meal flour, 5% dried yeast, 15% dried skimmed milk, 10% meat and bone meal, 2% cod liver oil, and 1% each of NaCl and CaCO₃. The diet gave growth rates equal to those of animals on a full cream milk diet, but was unsuitable for breeding stock.

Special wire containers were made for cubed food. In the case of solid zinc mouse boxes, the basket was semicircular in cross section, 3 in. high and 4 in. along the flat side. It was hooked to the end of the box at such a height that the lid closed the top of the basket. For other types of cage the container was fitted with four legs, so that it stood on the bottom of the cage, and two vertical prongs projected through the lid of the box to prevent the container from being overturned. Baskets of a similar type, but holding larger amounts of food, were designed for rat boxes.

Comparative experiments showed that mice consumed about 5 g. of cubed food per day. 2 g. per day were grossly inadequate; a 50% increase, however (3 g.), gave a very marked improvement whilst a further 60% increase (4.8 g.), to a maximum of 5 g., made very little difference over 50%. The extra food was probably partly wasted by

excretion. For rats, the optimum amount seemed to be 12-14 g. daily. The cost of the ration per day was about 1/30th of a penny for a mouse and 1/10th of a penny for a rat.

II. In view of the expense of green food, experiments were carried out with rabbits to determine whether a suitable dried diet could be evolved. Growth rates were observed on female Dutch rabbits with an initial weight of about 1 kg. Two diets which were finally selected were:—(1) 15% bran, 20% dried sugar beet pulp, 15% ground nut meal, 10% linseed cake, 8% dried meat and bone meal, 30% dried grass meal and 1% each of NaCl and CaCO₃, and (2) a similar mixture, in which sugar beet pulp was replaced by barley meal. The mixtures were given in pelleted form and the rabbits had access to hay and water. The consumption was about 70 g. per day and resulted in an increase in weight from 1-2 kg. in about 70 days. The cost was 1/3d per day.

Neither cod liver oil, nor vitamin C, other than the quantity present in the dried grass meal, seemed to be necessary. Indeed, the addition of 3% cod liver oil in the absence of grass meal resulted in losses in weight and in some instances, in death from muscular dystrophy.—R. E. G.

KINSLEV, C. C. (1940.) **Det intraokulaere Tryk hos Hunden. [The intraocular pressure of dogs.]**—*Maanedsskr. Dyrslaeger.* 52. 409-425. 1467

The physiological basis of intra-ocular pressure is described. Schiötz's tonometer was used for the measurement of intra-ocular pressure in dogs with normal and pathological eye conditions. The pressures recorded in 150 dogs varied from 10-25 mm. Hg, yielding an average value of 17 mm. Ageing caused a fall in pressure. Although the pressure in each case was fairly constant, the variations between individuals precluded any correlation with breed or bodily characteristics. The instrument cannot be used in certain conditions, such as corneal ulcer and restless animals sometimes required local anaesthesia. General anaesthesia caused alteration in intra-ocular pressure. The diagnostic value of tonometry, especially in incipient glaucoma, is discussed.—E. F. MCCARTHY.

OTTOSEN, H. E. (1941.) **Om Fluorescensmikroskopets Anvendelse til histologiske Undersøgel-**

ser. [Use of fluorescence microscopy for histological examinations.]—*Maanedsskr. Dyr-laeger*. 53. 279-292. 1468

Substances which are fluorescent, such as berberine sulphate, coriphosphine, aurophosphine, primuline, and auramine were tested on different tissues of animals. Fluorescence microscopy did not reveal details in histological section that were not revealed by the staining methods in general use. Acid-fast bacilli were easily found in the fluorescent preparations and the technique may be of some importance in this respect.

—H. C. BENDIXEN.

COBE, H. M., & SCHAEUFLE, A. (1946.) A practical and inexpensive method for fixation of paraffin sections to slides.—*Amer. J. clin. Path. Tech. Sect.* 16. No. 1. 31-32. 1469

200 mg. of sodium or potassium dichromate are dissolved in 1 litre of distilled water. 200 mg. of gelatin are added and the whole boiled for 5 min. When cooled and filtered this solution may be used undiluted, as a substitute for diluted Mayer's egg albumin. It may be used also for the floating and fixing of frozen sections.

—LIONEL M. MARKSON.

See also absts. 1432 (synopsis of clinical laboratory methods), 1479 (blood sedimentation).

REPORTS

CEYLON. (1946.) Administration report of the Acting Director of Agriculture for 1944. Part IV. Education, Science and Art (D). [SENEVIRATNE, L. J. DE S.] pp. 23. Items of veterinary interest pp. 14-16. Colombo: Govt. Press. 8vo. 50 cents. 1471

The scheduled diseases of animals recorded in Ceylon during the year included ANTHRAX, HAEMORRHAGIC SEPTICAEMIA, BLACK WATER [BLACKQUARTER?], PLEURO-PNEUMONIA of goats, SURRA, PIROPLASMOSIS, FOOT AND MOUTH DISEASE, RABIES and RINDERPEST. An outbreak of ANTHRAX, causing 100 deaths in a dairy herd, was controlled by the use of antiserum. Fairly heavy losses from ANAPLASMOSIS and PIROPLASMOSIS occurred in cattle imported from Australia during the year and at a station where Australian cattle are maintained tick-borne diseases continued to occur, second and third attacks being not uncommon amongst adult cattle, although calves born locally stood up to the conditions better than imported animals. Only one province escaped RINDERPEST, the total death rate being 0.2% of the cattle and buffalo population. The disease was dealt with by isolation of affected animals and the use of antiserum, formolized spleen pulp and goat virus. The last gave a mild thermal reaction in local

— (1946.) Availability of radioactive isotopes. —*Science*. 103. 697-705. 1470

This is an announcement from the headquarters of Manhattan Project, Washington, D.C., giving details of the availability of the various radio-active isotopes, the organization for their allocation and distribution, and the procedure for making application for supplies for research purposes. An interim advisory committee, formed from representatives in each of the major fields of isotope application, will deal with the distribution of the materials available.

Tables are given with details of the radioactive isotopes available or being prepared. They are divided into two classes:—(1) Products derived by fission of U 235 nuclei ("fission products"). (2) Neutron-induced products ("non-fission" products). In each case only isotopes of half-life greater than 12 hours are considered; those listed have a half-life varying from a few days to more than 30 years. Radio-active materials will at present be supplied only to accredited institutions or organizations and not to private individuals.

—E. G. WHITE.

animals, but in cross breeds a severe reaction unless serum was also administered. Susceptible cattle in-contact with inoculated animals did not contract infection.

Livestock breeding centres were maintained, service by improved animals being available for the local farmers. Statistics are given showing the number of animals slaughtered annually from 1934-44 and the ruminant population in 1944.

—U. F. RICHARDSON.

NIGERIA. (1946.) Veterinary Department, Nigeria. Annual report for the year 1944. [SIMMONS, R. J.] pp. 19. Lagos: Govt. Printer. London: Crown Agents for the Colonies. 8vo. 1s. 1472

In view of war conditions efforts were concentrated on the control of the more serious epizootics and the maintenance of meat supplies. No serious outbreaks of ANTHRAX occurred during the year, the relative freedom being ascribed to the practice of annual immunization. TUBERCULOSIS and HAEMORRHAGIC SEPTICAEMIA did not occur to any serious extent and the incidence of BLACKLEG appears to have been reduced by vaccination. Two cases of debility in horses were tentatively ascribed to latent EPIZOOTIC LYMPHANGITIS on account of their response to treatment

with potassium iodide and the finding of cryptococci in the centrifuged urine of one animal. BOVINE CONTAGIOUS PLEURO-PNEUMONIA was dealt with by vaccination, if possible by triple injection, but the necessary stock migration in the dry season prevented segregation for lengthy periods. It is suggested that little can be done towards eradication until a more efficient vaccine is available and a simple diagnostic test evolved.

13,326 head of stock were treated with tartar emetic for TRYPANOSOME INFECTIONS, principally due to *T. congolense* and *T. vivax*. In horses two cases are recorded of the appearance of *T. vivax* after phenothiazine treatment, suggesting relapse. RABIES is thought to be fairly widespread, but is difficult to eradicate owing to the large numbers of native-owned dogs which are not under control. There were occasional outbreaks of RINDERPEST along the northern border and a widespread immunization campaign was carried out in the Northern Province, in the later stages of which goat virus was used alone, with a mortality of approximately 1%. Treatment of young stock with sodium arsenite or phenothiazine at RINDERPEST immunization centres gave excellent results in reducing losses during immunization.

The section of the report dealing with the veterinary laboratory records observation on *Bunostomum* INFECTION of cattle and its adverse effect on the resistance of cattle to RINDERPEST immunization. Observations are also recorded on vaccination against BOVINE CONTAGIOUS PLEURO-PNEUMONIA, SALMONELLOSIS of calves, from which *S. dublin* was isolated, VITAMIN A and CALCIUM DEFICIENCY in pigs, and the value of phenanthri-

dinium S897 in the treatment of *T. congolense* INFECTION.

A short report on the progress of the veterinary school is also appended, disappointment being expressed that the government could not complete its consideration of the Veterinary Practitioners ordinance, which prevented the establishment of and Executive School Board.—U. F. RICHARDSON.

JAMAICA. (1946.) **Annual report of the Department of Agriculture for the year ended 31st March, 1945.** pp. 14. Items of veterinary interest p. 10. Kingston: Govt. Printer. 1473 fcp.

Surveys of TUBERCULOSIS and BOVINE CONTAGIOUS ABORTION were hampered by lack of transport, but two farms had been completely freed of both diseases and one was nearly freed. BLACKLEG was common owing to failure to vaccinate. ANAPLASMOSIS caused many deaths in cattle.

The progress of the Livestock Improvement Centres had been hampered by the difficulty of importing high grade males for stud, but locally purchased males were used with some success. Small-holders were being encouraged to increase their livestock. Feeding of rock phosphate (dicalcium phosphate) to cattle greatly improved their health.

The loss of the coconut crop as a result of hurricane caused a serious shortage of concentrates, but progress was made in production of fodder sorghums and grasses. Crude protein in the grasses was 125–300% higher than in the same grasses grown in Trinidad.—R. MACGREGOR.

BOOK REVIEWS

— (1946.) **Bovine mastitis. A symposium.** [Edited by LITTLE, R. B. (V.M.D. Department of Animal and Plant Pathology, The Rockefeller Institute for Medical Research, Princeton, New Jersey) & PLASTRIDGE, W. N. (Ph.D., Department of Animal Diseases, The University of Connecticut, Storrs, Connecticut).] pp. xiii + 546. Numerous figs., tables & refs. New York & London: McGraw-Hill Book Company, Inc. 8vo. \$7.00. 1474

All who are interested in bovine mastitis will welcome this book, which gives an excellent account of the various aspects of the disease and is written by a group of 11 workers, all of whom have special experience of the subject. The book comprises a general introduction, 17 chapters of text and an appendix of technical methods. At the end of each chapter is a list of references varying in length from three to over 100.

The first two chapters deal with the anatomy

of the udder [EMMERSON, M. A.] and the physiology of milk secretion [TURNER, C. W.] and form an excellent introduction to the subsequent chapters. The third chapter [SHOLL, L. B.] deals with the pathology of the disease and contains only three and a half pages of text, some photomicrographs and three references to published work—a striking illustration of the small amount of attention paid to the morbid anatomy and histology of mastitis. Chapter IV is devoted to the physical examination of the udder and various methods of examining milk for the diagnosis of mastitis. There follow chapters on the bacteriology of the disease [LITTLE, R. B., BROWN, J. H., & PLASTRIDGE, W. N.] and the serological classification of mastitis streptococci [STABLEFORTH, A. W.]. The remaining chapters deal with environmental and hereditary factors, transmission, mastitis in heifers, eradication of chronic mastitis, vaccination, other forms of treatment, public health aspects, quality

of dairy products, stable hygiene, recommendations for state control of the disease and mastitis in goats.

The appendix gives detail of various indirect tests for mastitis, preparation of special culture media and staining methods. In a short addendum the recent (1946) report of the isolation by BAKER & LITTLE of a virus-like agent from g. pigs inoculated with milk from cows with acute mastitis is discussed: the authors consider that it is unlikely that the common organisms found in bovine mastitis require the presence of a virus to initiate the disease, but that it is possible that a virus may be concerned in some acute outbreaks in which bacteria cannot be isolated.

Tuberculous mastitis is dealt with in one paragraph, an indication of the success in the United States of the programme of tuberculin testing and eradication of tuberculous cattle and the widespread pasteurization of milk.

The book is well produced and printed. It will be read with interest by veterinarians, veterinary students, dairy workers and all who have any concern with milk production.—E. G. W.

BOYD, M. F. [M.D., M.S., C.P.H., Field Staff Member, International Health Division, Rockefeller Foundation]. (1946.) **Preventive medicine.** pp. x + 591. 187 figs. Philadelphia & London: W. B. Saunders Company. 7th Edit. revised. 8vo. 27s. 6d. 1475

Since the first edition of this book appeared in 1920 a new edition has been called for about every five years. The latest edition incorporates many of the advances of recent years and is designed to serve the needs of medical students in the U.S.A. The sections of particular interest to veterinarians are two chapters dealing with milk and two chapters devoted to lower animals as sources of infection for man. The section dealing with milk includes a discussion of the production of clean milk, pasteurization, and milk-borne epidemics. Mammary TB. is said to be very rare in cattle and the presence of tubercle bacilli in milk is stated to result usually from milk contamination by bovine faeces (p. 251). No evidence is quoted in support of the latter statement.

In the section dealing with diseases transmitted to man by animals, most space is devoted to the rat, louse and tick as disease vectors. Other diseases considered include rabies, anthrax, glanders, tetanus, psittacosis, equine encephalomyelitis and leptospirosis. Anthrax is said to have increased to an alarming extent in the U.S.A. in recent years, particularly among wool sorters: this is attributed in part to the importation of poor quality wool which formerly went to Great Britain until the institution of com-

pulsory disinfection in 1921 made its importation to Great Britain less profitable. Swine erysipelas and fungus infections are not mentioned.

The book attempts to cover an enormous field, including nutrition, occupational diseases, heredity, hygiene and demography. The text is illustrated with many photographs, charts, diagrams and tables. The bibliography consists merely of lists of journals dealing with public health and preventive medicine and of text books and monographs. The whole volume is designed to meet the needs of the student rather than of the research worker.—E. G. WHITE.

— (1946.) **Penicillin. Its practical application.** [Edited by FLEMING, A. (M.B., B.S., F.R.C.P., F.R.C.S., F.R.S., Professor of Bacteriology in the University of London, St Mary's Hospital, London).] pp. x + 380. 59 figs. London: Butterworth & Co. (Publishers), Ltd. 8vo. 30s. 1476

This is not a continuous textbook but a series of independent contributions on the use of penicillin in therapy, with the object of instructing practitioners how they may use penicillin to the best advantage. The editor, SIR ALEXANDER FLEMING, contributes sections on the history and development of penicillin and on the bacteriological control of penicillin therapy. Other general articles deal with chemistry and manufacture, pharmacy, pharmacology and methods of administration. The greater part of the book is taken up by a series of articles on the specialized use of penicillin by a number of clinicians. One article, by DR. R. LOVELL describes the use of penicillin in animal diseases and summarizes the results which have been obtained in treatment of strangles in horses, of bovine mastitis, bovine pyelonephritis and swine erysipelas. Many of the articles are well illustrated and have bibliographies. The book is possibly the first authoritative account of penicillin and is an ideal account of a subject under rapid development.—E. B.

FRAUCHIGER, E. [Dr. med., Professor für vergleichende Neurologie an der Universität Bern]. (1945.) **Seelische Erkrankungen bei Mensch und Tier. Eine Grundlage für eine Vergleichende Psychopathologie.** [Mental disorders of man and animals. A basis for a comparative psychopathology.] pp. 282. 37 figs. Bern: Hans Huber. 8vo. Sw. Fr. 18.50. 1477

DR. FRAUCHIGER is a medical neurologist who for the past ten years has worked in close association with PROF. HOFMANN of the veterinary ambulatory clinic in Berne: in 1941 they published jointly "*Die Nervenkrankheiten des Rindes*" [see V. B. 16. 288] and DR. FRAUCHIGER is also

well known for his articles on the nervous system in domestic animals. The work now under review consists of three sections:—Part I gives a short historical introduction to the development of psychiatry and neurology and discusses the various methods of approach. Part II deals with general psychopathology, with illustrations from the medical and veterinary field. Part III is devoted to special psychopathology. Throughout the book an attempt is made to correlate and compare the data on man and animals and to consider comparative psychopathology as a whole.

There is much of interest to the veterinarian in the book. The material dealing with domestic animals includes consideration of temperament, breed, paralysis, "speech", the nervous form of distemper, *Dummkoller* in the horse, hysteria, disorders of sexual behaviour and unsoundness in the horse—to mention only a few. A list of references is given at the end of each of the three sections.

Much has already been published on the psychopathology of man and there is a fair amount of information dealing with the subject in experimental animals, wild animals and animals (especially apes) in captivity: in the veterinary field very little has been published and FRAUCHIGER's book forms a useful basis for further work.

The book is written for three main classes of reader: medical psychopathologists (to provide them with information on comparative psychiatry), zoologists (to relate mental disorders throughout the animal kingdom) and veterinarians (to collect for them much of what is known about the psychopathology of domestic animals and to indicate how this knowledge may be extended).

Psychiatry itself is still in its youth and there remains much difference of opinion among the experts, but there is no doubt that the book is a useful contribution to veterinary and comparative psychopathology and will be welcomed by all who intend to study this subject.—E. G. W.

BRAY, W. E. [B.A., M.D., Professor of Clinical Pathology, University of Virginia, Director of Clinical Laboratories, University of Virginia Hospital]. (1946.) *Synopsis of clinical laboratory methods*. pp. 528. 93 figs., 20 plates. St. Louis: C. V. Mosby Company. 3rd Edit. 8vo. 25s. 1478

The object of this synopsis, originally published in 1936, was to bring together in a small volume for ready reference "the more recent information and the most frequently used methods of laboratory diagnosis". To avoid making the book ponderous, the author has selected with care; there is no padding with antiquated or substituted information and alternative methods are not widely

given, but the object of the synopsis is well served.

The book is composed of 16 chapters which deal successively with general rules and laboratory examinations of value in various conditions, with urine analysis, haematology, blood chemistry, gastric analysis, examination of faeces, puncture fluid examination and cerebrospinal fluid examination, sputum, bacteriology, water and milk examinations, serology, basal metabolism tests, allergy tests, poisons and foreign substances, surgical pathology, and indicators, stains, reagents, and various tables. Much recent information is included and the author gives good descriptions of Rh factors, fluorescent microscopy for acid-fast bacilli, the antigenic classification of the salmonellas, etc.; a section on penicillin has been added in this edition. The book deals essentially with the field of human medicine and is too complicated for the general student, but its nature and up-to-date information are likely to make it valuable to the research worker and technician, whether he is interested in medical or veterinary science. The volume is well bound, conveniently small to handle with ease, adequately illustrated, with about 100 black and white figures and 20 colour plates, and concludes with a 30-page index.

—M. L. LEVI.

BARBIER, J. [Médecin des Hôpitaux de Lyon], & PIQUET, G. [Ancien interne des Hôpitaux de Paris]. (1946.) *La sédimentation sanguine en pratique médicale courante*. [*Blood sedimentation in current medical practice*.] pp. 176. 33 figs. Paris: Masson et Cie. 8vo. 2nd Edit. 230 fr. 1479

The first edition of this monograph was published in 1940: the new edition is much enlarged and includes the experience which the authors have gained from more than 100,000 sedimentation tests on human patients. The first seven chapters deal with the technique of the test and the results obtained in a variety of diseases. The remaining six chapters are devoted to a physical and biological study of the test and are contributed by DR. JACQUES BADIN. A technique suitable for use at the bedside is described: by means of a portable electric centrifuge with a rheostatic control the tubes are centrifuged at 500 r.p.m. for 10 min. and the test is read at once. Generalized infections cause increased sedimentation rate and the authors consider that if the test is carried out at frequent intervals it is of value in diagnosis, prognosis and treatment. The test is considered to be of special value in assessing the progress of tuberculous patients and may also be of use in a variety of other conditions.

—E. G. WHITE.

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